THE IRON TRADE REVIEW

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Steel Corporation Enters Market as a Buyer

Taking Large Tonnages of Basic and Bessemer Pig Iron and Scrap—Increased Demand for Pig Iron and Brighter Prospects

New York, March 6. (By wire.)—The United States Steel Corporation having practically exhausted its stock of melting material, entered the market today and has purchased a round tonnage of Bessemer and basic pig iron and heavy melting scrap. Further tonnage is under negotiation. Figures of purchase are not announced. The total will be an important tonnage. The Corporation is now operating from 88 to 90 per cent of its capacity and decided to enter the open market rather than blow in the idle isolated furnaces. Two large independent steel companies have also bought iron in the past two days.

Indications, according to leading steel makers, point to a heavy buying movement close at hand. Important inquiries for finished materials are pending and it is predicted that high prices are imminent. One large operator predicts 1.15c on bars and 1.25c on shapes and plates in the next few weeks.

Pig Iron

Next to the Corporation purchase, the most interesting feature of the market was selling of basic at Pittsburgh, where deals for more than 50,000 tons were closed in lots of from 1,000 to 15,000 tons, the principal sales being the Jones & Laughlin Steel Co., 10,000 tons, and the Pittsburgh Steel Co., 15,000 tons. It is understood that the stock of iron piled at the Midland furnace, which has been a factor of weakness in the market for some time, has now been disposed of. It is confidently expected that a Canadian consumer will be compelled to come into the market at an early date for from 40,000 to 50,000 tons of basic and Bessemer. Sales of Bessemer have been made at $14.25, valley, and prices on both Bessemer and basic are firmer and tending upward. In the Chicago district, southern pig iron has been purchased at higher prices than those recently prevailing and throughout the country sales at $10.50, Birmingham, for No. 2 are more frequent.

Finished Material

The rapid advance in the price of spelter has caused quotations on galvanized sheets and galvanized wrought iron pipe to be advanced from recent low figures. On black sheets the low quotation of 1.75c for No. 28 has apparently disappeared. Steel bars, which a few days ago seemed to be headed for 1.05c, Pittsburgh, are now apparently pegged at 1.10c. Some very low prices have been made on reinforcing bars, particularly in the Cleveland district. On plates and shapes, leading companies in the Pittsburgh district are showing less disposition to make low quotations. Car buying has not yet come up to the expectations of the plate mills, but leading plate makers feel that they can afford to refuse further concessions on plates on account of the expectation that the demand for plates for new cars will soon fill many mills comfortably. In Pittsburgh, inquiries for 25,000 tons plates are pending. Specifications in the tin plate market are above normal for this time of the year. Recent low prices made to a very large buyer are not being generally granted.

Pig Iron Production

By giving February one more day, leap year helped last month to make a better showing in pig iron production. The output was 2,098,796 tons, the largest monthly production since March, 1910. The increase over January was 45,990 tons. The merchant iron increase was 3,443 tons, and that of steel-making iron 52,272 tons, while spiegel and ferro decreased 9,725 tons. The average daily production was 72,372 tons, compared with 66,220 tons in January. February's daily average was the largest since June, 1910.

Iron Ore

Complete statistics of Lake Superior iron ore for last year show that 32,793,130 tons were shipped, compared with 43,442,397 tons in 1910, a decrease of 10,649,267 tons. The all-rail shipments decreased 20 per cent, and the lake shipments 25 per cent. The most interesting feature of the statistics is the demonstration of the power of the Steel Corporation to adjust itself to new conditions. As the Steel Corporation has given notice of surrendering its lease on the Hill ore lands Jan. 1, 1915, it is highly important for it to ship as much ore as possible before that date. Starting Jan. 1, 1911, with a heavy shortage of the required shipments, the Corporation last year mined 5,499,759 tons, against 2,152,977 tons from these lands in 1910. This reduced the shortage to about 3,500,000 tons. The shipments for the three remaining years of the lease must be 19,167,862 tons. It is probable that 8,000,000 tons will be moved this year.

PITTSBURGH

Greatest Activity in Basic Pig Iron for Months

Office of THE IRON TRADE REVIEW, 2148-49 Oliver Bldg., March 5.

A new buying movement in pig iron has been the strong feature of the iron and steel trade of the Pittsburgh market during the past week. Sales aggregating over 60,000 tons of basic iron figure in the reports of the week, and a sharp trend upward in the price of basic iron followed as a natural result. As the buying has been mainly for March and April delivery, it is believed that it has cleared up most of the stocks of basic iron available for prompt shipment and placed the furnaces in a better position that for some time. A better show is also made in the semi-finished steel trade. Available tonnage developing in the past 10 days has been absorbed readily and caused a hardening of prices for Bessemer and open hearth rolling billets, with makers well supplied with orders for the next 30 days. Plates and structural steel show little change, but are fairly firm. Steel bars are held at 1.10c, Pittsburgh, in so far as the Pittsburgh makers are concerned, but eastern mills are said to be shading this price. The greatest element of weakness is clinging close to the lighter finished products, sheets and tin plate, and new business is being taken, particularly west of Pittsburgh, somewhat more freely at 1.75c base, for sheets, while tin plate producers are inclined to accept new tonnage at $2 a ton under the nominal quotation of $3.40 base price. An improvement is noted in the iron bar trade which is mainly sentimental, but encouraging. Coke prices show further firmness and spot coke is scarce at this time, with production maintaining a good average of slightly less than 400,000 tons a week in the Connellsville region. Dullness in old material demand is still extant. The consumers have sufficient supply on hand to remain out of the market except on most favorable prices while dealers are unable to meet the demands made for lower rates. Pipe buying is very active, and some new inquiries of an extensive character are appearing. Smaller orders are quite numerous and in the aggregate are important. Merchant pipe is in good demand.

Pig Iron.—The pig iron market for the past week has shown greater activity, with larger sales, than for some months. More than 50,000 tons of basic iron were closed out in lots of 1,000 to 15,000 tons for Pittsburgh delivery, the notable sales being that to the Jones & Laughlin Steel Co. for 10,000 tons, the Pittsburgh Steel Co. for 15,000 tons and the Carbon Steel Co., and a number of smaller buyers with varying contracts, slightly exceeding the total of the two mentioned, and bringing the total up to something over the 50,000 tons. In addition to this, one valley furnace reports a sale of 1,000 tons of basic, and another, of 3,000 tons, making a total of 10,000 tons additional, the price, ranging from $12.50 to $12.75 valley. Besides these sales, which have practically cleaned up basic iron, in the furnace yards, a feature has been the reported wiping out of the stock iron piled up at the old Midland furnace, commonly known as the Flinn iron, and some tonnage held by speculative interests, representing the production of the Midland furnace prior to its purchase by the Pittsburgh Crucible Steel Co. The 50,000 tons of iron purchased in Pittsburgh is for March and April delivery, and there is a very excellent inquiry for additional tonnage, which is likely to further strengthen the prices during the present month. The sale of 1,000 tons of standard Bessemer iron at $14.25 at the close of last week, has aroused fresh interest in the Bessemer grades, and the inquiries indicate renewed activity among Bessemer consumers, with the promise of considerable demand coming out. The average prices obtained for Bessemer and basic iron during the month of February by one interest were, $14 for Bessemer and $12.25 for basic. This, however, represented the influence of the extreme low points of the market, as towards the close of the month there was a sharp improvement. Some of the valley furnaces are now holding basic iron at $13, and while Bessemer is probably available at $41 on attractive business, $14.25 is the nominal price, and considerable small tonnage is moving at that figure. Malleable iron in car-load lots is slightly stronger, a sale of 200 tons being reported at $13.10 valley. Foundry iron shows a better line of inquiry at $13.25 valley. Considerable inquiry for second quarter iron is coming out for both foundry and malleable. La Belle Steel Co.'s No. 2 stack at Steubenville was blown in this week, and will be run on basic. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	14.90
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	13.90
Gray forge, Pittsburgh	13.40
Malleable, Pittsburgh	13.65

(First Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.30
No. 2 foundry, Pittsburgh	13.90
Gray forge, Pittsburgh	13.40
Malleable, Pittsburgh	13.65

Ferro Alloys.—The withdrawal of all prices last week by the foreign market on manganese has apparently made little change in the demand for ferro-manganese, and while inquiries are coming in at a normal rate for carload lots, the best that has been done in the Pittsburgh territory has been $41, seaboard, on ferro-manganese, while 50 per cent ferro-silicon has shown a slight upward tendency, with small sales of carload lots at $70 to $71. The domestic grades of ferro-silicon are steady, but buying is very much restricted.

We quote ferro-manganese nominally at $41, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70 to $71, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—Specifications are more liberal for plates, and some new business is appearing in the market from eastern and western centers, which has caused increased shipments, and a still higher mill schedule where this is possible. Some of the leading producers are somewhat behind on

deliveries. There is little effort to secure business under 1.15c. and this apparently has become a well-fixed minimum in Pittsburgh territory. Car buying has not shown any special change. The placing of the order for the Western Maryland for 2,750 cars is still unsettled, but promises are made that this will be out this week. The Northern Pacific has ordered 750 steel cars of various types from the American Car & Foundry Co., and the Rock Island has pending an order for 750 cars of various types, which are expected to be entered on builders' books within the next ten days. Ship plates are in active demand. A fair tonnage is now on the books of the mills and there is in sight more than 25,000 tons of new business, inquiries for which have been out for some weeks. While there are reports in Pittsburgh of a lower than the 1.15c price being made on plates in the east, this does not disturb the local conditions, and there is an apparent determination to hold firmly to this figure. Slightly more is asked on small tonnages. Mills are a little behind on deliveries, due to car shortage and the severe weather. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.10 to 1.15c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The demand for sheets shows no letting up so far as specifying against contracts is concerned, and mills are generally reported as being behind on shipments, blaming the major portion of the trouble on car shortage, but at the same time holding that with normal car supply, their shipments would be extremely heavy. There is very little new business reported, such as is going being taken at prices which indicate a further softening of the market, especially west of Pittsburgh. An inquiry for 500 tons of sheets is understood to have disturbed the price considerably. While the leading interest is maintaining a firm attitude, and $1.80 is generally quoted on No. 28 gage black sheets, f. o. b. Pittsburgh, $1.75 is a little more commonly quoted in the middle west, where competition for forward delivery among independents has become very keen, and this competition has resulted in sacrificing any benefits of location relative to points of shipment from mills. There is little change in the galvanized sheet market, which is holding fairly firm at 2.85c to 2.90c. The most serious situation exists in car supply, many mill warehouses being overstocked and far behind in shipments, and utterly unable to secure any reasonable car supply. The assertion is freely made that unless a break comes within a week, mills will be obliged to suspend, pending some clearing out of the overstocked warehouses. We quote the market as follows:

Blue annealed sheets No. 10 gage, 1.35c to 1.40c; black annealed sheets No. 28 gage, 1.75c to 1.85c; galvanized sheets, No. 28 gage, 2.85 to 2.90c; painted roofing sheets, $1.35 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.45 per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburgh.

Tin Plates. — Specifications in the tin plate market are continuing above normal for this season, and production is large, much larger, in fact, than is considered normal for this time of the year. Many canners are taking larger tonnages than usual early this season. There is, however, insufficient new business coming out to maintain a strong position as to price, and further softening of prices is reported. Some business is going at $3.30 base, Pittsburgh, and attractive orders could undoubtedly secure a further concession. The leading interest is holding firm to its price, and is so comfortably filled up on tonnage that it is maintaining a high record of shipment, and closed February with one of the best monthly records it has made. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.30 to $3.40, f. o. b. mill, Pittsburgh district.

Rails and Track Material. — Railroads are increasing their specifications on all large orders for rails, and mill operations in the Pittsburgh territory have increased correspondingly, with shipments in excess of the same period of a year ago. There is considerable new tonnage being looked for this spring for eastern lines, this tonnage being mainly for extensive work in double tracking, and considerable new construction work, which promises to develop further along in the year. The light rail demand has been keeping up, prices are very firm, and shipments are increasing. Unusual activity has developed in the mining trades, which are not showing any influence of the threatened miners' strike. Track material is improving in demand, considerable inquiry being in the market occasioned by the near approach of spring, when work will be possible. Export rails are also a strong factor, especially in the open-hearth grades. The market is quoted as follows, and the base price on open-hearth steel rails 1.34c per pound at the mills:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅝	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅞	.60
2 x ⅞	.80

Steel.—The demand for Bessemer and open-hearth rolling billets is still fairly active, and prices are being maintained in the Pittsburgh territory on the base of $20, Pittsburgh, and $21 for sheet bars of both grades. There are reports of a very slight softening tendency for exceptionally attractive business on billets in large lots of regular sizes, but such business is not appearing, and the larger producers outside of the leading interest are now so self-contained on billet production that they are not seeking actively for new orders. Some reports as low as $19.50 on Bessemer billets, Pittsburgh, have reached the local mills from eastern markets, but it is maintained here that the price could not be duplicated in Pittsburgh. Youngstown producers are well booked up, and are not actively in the market for business below the prevailing quotation. There is a scarcity still reported for open-hearth sheet bars for prompt shipment, and this has been an influence working for the stronger tone of the market generally. The leading interest reports a very much heavier shipment of steel for February over January, in spite of February being the shorter month. Forging billets are firm in Pittsburgh at $28. Inquiries are increasing, and the steel market is tending toward a stronger position with buying increasing and considerable inquiry out for the second quarter. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20, with the usual extras for size and analysis, and open-hearth rolling billets, $20; Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $21, f. o. b. Pittsburgh, with full freight to destination added. Forging billets are quoted at $28, Pittsburgh.

Hoops and Bands.—There is a good specifying against contracts for hoops and bands, and some new business is reported which has been taken on the base of 1.30c, Pittsburgh, for prompt

shipment. There is still a lack of stock accumulation in the hands of consumers, and with the present disposition for liberal specifying, the market is maintaining a fairly firm position, with all mills able to maintain a good running schedule. We quote the market as follows:

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands, 1.15c, base, with net extras, as per standard steel.

Merchant Bars.—The demand for merchant bars is quiet in so far as new business is concerned, and mills are not so well provided with specifications as they would like, even at the lower prices that have been running quite generally, so that while the leading interest has announced its retirement from the market for any business below 1.10c, there is said to be considerable such tonnage going in the east. Prices mentioned are as low as 1.05c, Pittsburgh base, but for eastern shipment, and for eastern mills. This lower price has caused a hesitancy on the part of consumers with contracts at 1.10c to specify very liberally, and as a result, mills are feeling the quieter movement and are slowing down somewhat on running schedules. The market for iron bars has shown signs of improvement, not so much in new tonnage being placed, as in a more liberal specifying against contracts, and the larger producers of iron bars are reporting 1.30c, f. o. b. Pittsburgh, as the best quotation being made. Some business is reported based on 1.25c, mill, in Pittsburgh, on exceptionally desirable business, but this is not of sufficient importance to make a market quotation. The steel shafting market has shown little change during the week. A little better specifying has been reported by consumers, but prices are showing a tendency downward that would become more pronounced should sufficient business appear to draw it out. We quote the market as follows:

Common iron bars, 1.30c, Pittsburgh; Bessemer and open-hearth steel bars, 1.10 to 1.15c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—There is no change reported in the market for muck bar, except a slight improvement in the specifying against contracts. Some of the larger consumers have shown a desire to take on more stock for the early spring. Shipments are fair and slightly improved in volume, and we continue to quote $28 to $29, Pittsburgh.

Structural.—The structural steel market has felt the severity of the weather prevailing somewhat keenly the past week, and as a result, little new tonnage has appeared, although prices are held firmly at 1.15c, and inquiries are reported somewhat better in tone, with the bulk of the buying apparently promised in the eastern and western sections. In the Pittsburgh district, but little new business has appeared. The award of the contract for the new East End Savings & Trust Co. building is expected out in a few days. This will require between 5,000 and 6,000 tons. An inquiry is also looked for in the immediate future for the Monongahela House rebuilding, which will take between 7,000 and 8,000 tons. Some bridge work for the Pennsylvania and Baltimore & Ohio Railroads is also due, and some industrial building construction is on the books for estimate. The situation, however, is very quiet, and until there is a more definite breaking up of the winter, a decided improvement is not looked for. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.15c; tees, 1.15c; angles, from 3 to 6 inches, 1.15c; over 6 inches, 1.25c; universal and sheared 1.15c to 1.20c; over 15 inches, 1.25c to 1.30c, plates, 6¼ inches wide and wider, 1.25c.

Merchant Pipe.—There is a good demand for merchant pipe this season, with new business coming out in small lots quite actively, and enabling the mills to slightly increase their running schedule. While prices are very firm, the jobbers and consumers generally are showing some anxiety in placing their requirements under contract for from three to six months on the present list of quotations. In steel line pipe, considerable interest has been aroused by an inquiry this week for from 62 to 73 miles of 10¾, 12 and 16-inch pipe, by a local gas company for early delivery. There is still pending in the market an inquiry for 60 miles of 12-inch steel line pipe for Ohio delivery, while orders from two to five miles of small sizes have been placed, which in the aggregate represent a good tonnage. We quote the official discount to jobbers subject to the usual preferential discount to the larger buyers.

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	74	54	68	48
⅜ inch	75	65	69	59
½ inch	78	68	72	62
¾ to 1½ inch	81	73	75	67
2 to 3 inches	82	75	76	69
	Lap weld.			
2 inches	79	72	72	65
2½ to 4 inches	81	74	74	67
4½ to 6 inches	80	72	73	65
7 to 12 inches	77	68	71	61
13 to 15 inches	55	..	47	..
Extra Strong, Plain Ends.				
			Butt weld.	
⅛, ¼, ⅜ inch	70	60	65	55
½ inch	75	69	70	64
¾ to 1½ inch	79	73	74	68
2 to 3 inches	80	74	75	69
Extra Strong, Plain Ends.				
			Lap weld.	
2 inches	76	70	71	65
2½ to 4 inches	81	74	74	67
4½ to 6 inches	77	71	72	66
7 to 8 inches	70	60	65	55
9 to 12 inches	65	55	60	50
Double Extra Strong, Plain Ends.				
			Butt weld.	
½ inch	65	59	60	54
¾ to 1½ inch	68	62	63	57
2 to 3 inches	70	64	65	59
Double Extra Strong, Plain Ends.				
			Lap weld.	
2 inches	66	60	61	55
2½ to 4 inches	68	62	63	57
4½ to 6 inches	67	61	62	56
7 to 8 inches	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price.)

Boiler Tubes.—An improvement is noted in specifications on boiler tubes, and some new business is appearing that is showing the market firm. A better buying movement is expected, but this can be easily cared for as the mills have been generally running on easy schedules for the greater part of the winter. The increased buying of locomotives by railroads and improved conditions in the ship building trades are said to have brought about a more active inquiry and better shipping movement in boiler tubes. The official discount on steel and charcoal iron boiler tubes follows:

Steel:

1¾ to 2¼ inch	65
2½ inch	67½
2¾ to 3¼ inch	72
3¾ to 4½ inch	75
5 and 6 inch	67½
7 to 13 inch	65

Charcoal Iron:

1½ inch	48
1¾ to 2¼ inch	50
2½ inch	55
2¾ to 5 inch	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—There is a somewhat quieter movement in the market for wire products. A good many mills have finished on their specifications on low priced wire, and are ready to go on with such as come in on the $1.55 base, but are finding some hesitancy on the part of buyers in taking much stock on this higher rate. There is not believed to be a great deal of stock, at least in the hands of manufacturers, nor in distributing warehouses, and as the seas-

on is at hand for providing these stocks, it is believed that production will continue actively at most mills for at least another 30 days, irrespective of the present buying movement. The larger manufacturers are holding firmly to the $1.60 base on all new business coming out, but admit that this is of very restricted volume. Some smaller producers are inclined to accept orders on extensions of the $1.55 base price for at least 30 days beyond the original time set. Confidence in the ultimate strengthening of the market, however, seems unshaken, and some caution is shown in accepting new business for forward delivery below the present price. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—Wire rod demand is continuing fair and consumers are specifying liberally against contracts, but have sent no new contracts as yet for second quarter. There is little new buying excepting in small lots, and this is at firm prices. Wire rod manufacturers who have any surplus production beyond their own requirements are accepting business for prompt shipment at $25.50, and will accept contracts for first half at $26. Any large business going, however, might get a better price than that. We continue to quote, however, $25.50 to $26, Pittsburgh, for Bessemer and open-hearth wire rods.

Coke.—The demand for furnace coke has quieted somewhat, but heavy shipments are going forward on contracts, and consumers are making an effort to accumulate a little stock at their plants to provide against a sudden shortage, due to the coal mining suspension, which will likely take place on April 1. Furnaces are taking more freely on contracts, and some inquiries for second quarter coke indicate a further stiffening of prices for strictly Connellsville grades. In foundry coke, the demand is active, but prices show no change, the market being firm at $2.25 to $2.50 on spot coke, and $2.25 to $2.40 on contract, according to the grade of coke desired. There is a shortage, however, in cars for foundry coke, and deliveries are somewhat slow as a result. Production for the last week showed a slight falling off from the previous week. The difference was only 2,411 tons. Of this, the furnace ovens lost 1,655 tons. The loss was due entirely to weather conditions, which prevented the full time operation of the plants. On furnace coke, while some business may be going at $1.85, the market is more nearly $1.90, and some sales in 25 to 50 carload lots were closed this week at a higher figure. A few sales were reported last week at $1.85 for delivery during March. We quote, however, standard Connellsville furnace coke for prompt shipment at $1.90 to $2 ovens, and on contract $1.85 to $1.95 ovens. We quote high grade Connellsville foundry coke for prompt shipment $2.35 to $2.50 ovens, and on contract from $2.25 to $2.40 ovens. The Connellsville Courier for the week ending Feb. 24, reports 30,736 ovens active with a production of 391,253 tons as compared with 30,592 ovens active and a production of 393,664 tons for the previous week.

Old Material.—The market for scrap is unchanged, and while consumers show a willingness to buy, the dealers are unable to accept prices that are offered, and are holding on to their stocks stubbornly, in the belief that the situation will change in the near future. Some small sales were reported, but these were not for local delivery. The situation appears to be one of a deadlock that will not clear up, until stocks are more generally reduced at the furnaces of consumers. We quote gross tons delivered in the Pittsburgh district including Monessen, Brackenridge, Steubenville and Follansbee, unchanged, as follows:

Heavy melting scrap	$12.25 to 12.50
Rerolling rails	12.75 to 13.00
Malleable	12.00 to 12.50
Bundled, sheet scrap	10.50 to 11.00
Iron axles	21.00 to 21.50
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.50
Machine shop turnings	9.25 to 9.75
Cast borings	9.00 to 9.25
No. 1 cast scrap	12.50 to 12.75

CHICAGO

Southern Pig Iron Sells at Higher Prices

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., March 5.

There is a heavy run of fabricating orders which marks practically the only feature in an otherwise unchanged situation. The Great Northern has purchased 3,400 tons of bridge material from the American Bridge Co., which has also taken 2,000 tons from the Seattle Construction & Dry Dock Co. for a steel dry dock; 4,000 tons of bridge material from the Rock Island and 3,000 tons from the St. Paul. The Goddard building, Chicago, 1,000 tons, has been let to the Noelke-Richards Co. Prices of finished materials are practically unchanged, with a slight hardness evident in the quotations on plates and shapes. The demand for bar iron has improved somewhat. Buying appears to be pretty thoroughly distributed.

Pig Iron.—The chief feature of interest during the past week again centered in the activities of the M. Rumely Co., Laporte, Ind., which was reported to be in the market for Southern iron a week ago. The buyer found that it was not possible to cover its requirements on a basis of $10, Birmingham, and, therefore, purchased Northern iron. It is understood 1,000 tons will be shipped from a Toledo furnace, the price being in the neighborhood of $13 at the furnace, equivalent to $14.50, f. o. b. Laporte. In general the market shows no increase in activity. A local manufacturer of railway supplies has purchased a small tonnage of southern iron and another railway supply company has closed on its inquiry for 200 tons of 5 to 6 per cent silicon, high manganese iron. A few sales of southern iron have been made in the Moline territory recently. A local manufacturer of telephones is in the market for 600 tons of 3 per cent silicon iron. Local furnaces continue to quote $14 at the furnace, which keeps the Chicago market practically in their hands. A general buying movement in pig iron is hardly to be expected this month.

The following prices represent the market for Chicago delivery, except

Northern foundry and malleable Bessemer, made in local furnaces, which are quoted f. o. b. furnace.

(First Half Shipment.)

Lake Superior charcoal	$16.50
Northern foundry No. 2	14.00
Southern foundry No. 2	14.60
Southern silveries, 5 per cent silicon	15.60
Jackson Co. silveries, 8 per cent	17.40
Malleable Bessemer	14.00
Alabama basic	14.85

Billets.—There is a fair demand for forging billets and on account of the heavy consumption of crude steel prices are quite firm. We quote for Chicago delivery as follows: Open-hearth forging billets, $26.50 and re-rolling billets, $23.

Merchant Bars.—There is a better demand for bar iron including both new orders and specifications on existing contracts. Prices are consequently somewhat firmer and the sporadic cutting below 1.15c, Chicago, which existed for some time, seems to have disappeared. There is very little that is new in the steel bar situation. Prices continue more or less irregular in the face of a good volume of specifications. There has been very little change recently in the demand for shafting, the discounts on which remain unchanged. Shipments of iron and steel out of stock are fairly good.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.15c to 1.20c; hard steel bars, rerolled, 1.15c to 1.20c; soft steel bars, bands and small shapes, 1.25c to 1.33c, base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock we quote as follows:

Bar iron, 1.50c to 1.60c per pound base; soft steel bars, 1.50c to 1.60c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—There have been a good many orders for bridges and buildings placed in the west recently and structural tonnage shows no signs of falling off. In the contracts placed last week, railroad orders are especially prominent. The American Bridge Co. has taken 3,400 tons of bridge material from the Great Northern Railway Co., 780 tons of deck plate girder spans from the Northern Electric Railway Co., of California, and 2,000 tons from the Seattle Construction & Dry Dock Co., successor to the Moran Co., of Seattle, for a steel dry dock. The Goddard building, Chicago, 1,000 tons, has been let to the Noelke-Richards Co. The Kenwood Bridge Co. has a contract for 276 tons of structural material for the Great Lakes Dredge & Dock Co. A. Bolters' Sons, Chicago, will fabricate 269 tons for the Northwestern Telephone Exchange Co.'s building at Duluth. The Judson Mfg. Co., San Francisco, has 102 tons for a building on the Presidio Military Reservation, and Dyer Bros., of San Francisco, have taken 701 tons for the new James L. Flood building in that city. Prices on plain material show no change, although there is some stiffness evident.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.28c to 1.33c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 to $1.65 per 100 pounds; angles over 6 inches, $1.70 to $1.75 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds, base; channels, 3 inches and larger, $1.60 per 100 pounds, base.

Rails and Track Fastenings.—There has been very little additional rail tonnage placed in the west recently. The Chicago, Rock Island & Pacific will shortly enter the market for 25,000 tons. Specifications for track supplies are keeping ahead of rail orders and the Joliet plant of the Illinois Steel Co. is operating on a very satisfactory basis.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.50c to 1.55c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.90c base.

Plates.—Liberal specifications from car builders and others are keeping the western mills in a comfortable position as regards plate tonnage. The amount of business on the mill books in the Chicago territory seems to be larger than it is at most other centers. The Northern Pacific has purchased 1,000 box cars, 50 tank cars and 25 passenger coaches from the American Car & Foundry Co. The Chicago, Milwaukee & St. Paul, which was recently mentioned as building 1,500 cars in its own shops, has now increased this order to 2,000. The Spokane, Portland & Seattle railway has ordered 17 coaches, four observation cars and one dining car from the Barney & Smith Car Co.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.28c to 1.33c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.60c.

Sheets.—The sheet tonnage holds up very well, but prices continue weak and irregular, due largely to competition from outside mills. Mills in this district are quoting 2.03c for No. 28 black and 3.03c for the same gage of galvanized sheets.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.90c; No. 12, 1.95c. Box annealed, No. 28, 2.30c. Galvanized, No. 28, 3.35c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—New business for wire products, especially from industrial sources, continues very light. Early crop prospects are exceedingly favorable and makers are expecting a very satisfactory demand from agricultural centers. Shipments are heavy on old contracts at 1.50c, Pittsburgh, for wire nails.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—The market for merchant pipe is still quiet and is not expected to improve until the cold weather breaks up permanently. There is no indication at this time that warehouse prices will be changed in the near future. Local mills are operating on slightly better schedules than they were a year ago. The demand for boiler tubes is moderately good and prices out of stock are unchanged.

We quote store prices on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	66.2	55.2
½ inch to 1½ inch.	78.2	69.2	71.2	62.2
Lap.				
2 inch	76.2	68.2	68.2	60.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends. Butt.				
⅛, ¼, ⅜ inch.....	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch...	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2

Double Extra Strong.

	Butt.			
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
	Lap.			
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3¼ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—Lettings during the past week were lighter than they have been for some time past. The United States Cast Iron Pipe & Foundry Co. is low bidder on 9,300 feet of 30-inch pipe at Seattle, Wash. Bids were opened March 6 at Kansas City, Mo., for 2,228 tons. Prices are quite firm with a tendency to rise.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—There has recently been a fair amount of buying by consumers to cover delayed shipments and as soon as the weather moderates permanently, receipts of scrap at this center are expected to be very heavy. The market shows very little change as far as prices are concerned and is not exhibiting any marked tendency toward either lower or higher quotations. Railroad offerings recently have been comparatively light.

We quote, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

Old car wheels	$13.00 to 13.50
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.75 to 12.25
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

NET TONS.

No. 1 R. R. wrought	$10.75 to 11.25
No. 2 R. R. wrought	9.75 to 10.25
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs.	10.00 to 10.50
Shafting	13.50 to 14.00
Iron car axles	18.00 to 18.50
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers' forge	8.75 to 9.25
Pipe and flues	8.00 to 8.50
No. 1 cast	10.75 to 11.25
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.25 to 6.75
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	6.50 to 7.00
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron..	12.50 to 13.00
Angle bars, steel	9.75 to 11.25
Stove plate and light cast scrap	9.25 to 9.75

CLEVELAND

Mining Companies May Sell Directly to Furnaces

Office of THE IRON TRADE REVIEW, Penton Bldg., March 5.

Iron Ore.—Representatives of Lake Superior companies who have just visited the east report that they met with no encouragement, as eastern furnaces apparently are not at all interested in lake ores at the present time. There is some indication of slight increase of interest among buyers in the central west and some sellers expect buying to begin about April 1. Some mining companies which have stocks of considerable size on hand, on both the old and new ranges, are showing their disposition to sell directly to furnace companies. Their attitude is a factor of weakness in the market. Ore sellers rather expected Mesabi ore to be offered directly to consumers, but the action of an old range mining company this week in offering to sell its ore to furnaces came as a distinct surprise. Some furnace men are of the opinion that there will be a reduction of about 50 cents per ton from last year's prices.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—There is very little activity in the Cleveland district, but prices are somewhat firmer. It is expected that a Canadian steel maker will be in the market at a not far distant date for a considerable tonnage of basic and Bessemer. We quote, delivered in Cleveland, for first half:

No. 1 foundry	$13.75
No. 2 foundry	13.25
No. 2 southern	14.35
Gray forge	12.50
Bessemer	15.15
Lake Superior charcoal	16.50
Jackson co. 8 per cent silvery	17.05

Coke.—Sellers of coke are still having a great deal of difficulty in making deliveries. Owing to the intense cold weather of the past two months, foundries have used unusual quantities of coke for heating purposes. As stock coke has been scarce, they were compelled to use standard foundry coke. We quote:

Connellsville furnace coke, $1.85 to $2.00 for prompt delivery, and $1.85 to $2.00 on contract; Connellsville foundry coke, $2.25 to $2.50 for prompt, and $2.25 to $2.40 on contract.

Finished Material.—The leading interest is standing firmly for 1.10c as the minimum on bars and 1.15c as the minimum on shapes and plates, and reports a very fair inquiry, particularly for shapes and plates. It is having difficulty in making shipments promptly enough to satisfy customers, as deliveries are now running from five to six weeks on plates and three to four weeks on shapes. Other companies are giving better deliveries.

Structural shops have not for a long time talked in as hopeful a way as they do today, and there is good prospect of active demand for shapes at an early date. On the whole, the finished material market is less demoralized and it seems as if the tendency toward extremely low prices, which was feared a few days ago, has been checked.

The Burger Iron Co., Akron, O., has taken 1,500 tons of steel for the proposed plant of the Diamond Rubber Co., Akron.

Old Material.—While some additional activity is being shown in the local market because of improving weather conditions, yet there is not a great deal of new buying. Consumers of heavy steel are taking small tonnages, although they are fairly well covered. We quote, gross tons, f. o. b. Cleveland, largely nominal, as follows:

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	11.25 to 11.75
Old steel rails (over 6 ft.)	11.50 to 12.00
Relaying rails	19.50 to 20.00
Old car wheels	11.50 to 12.00
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.00 to 11.50
Steel axles	17.00 to 17.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	7.50 to 8.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	9.50 to 10.00
Machine shop turnings	7.00 to 7.25
Pipes and flues	8.00 to 8.50
Wrought drillings	7.00 to 7.25
Stove plate	9.00 to 9.50
Cast borings	6.50 to 7.00
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	14.50 to 15.00

CINCINNATI

Pig Iron Shipments Moving More Satisfactorily

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., March 5.

Pig Iron.—The pig iron market is still exceedingly dull, and practically unchanged. The one encouraging feature is the fact that shipments are going forward at a satisfactory rate and in greater volume than was the case a few months ago. This can be attributed to the fact that some furnaces have practically contracted for their output for first half delivery, and the occasional demand made for spot iron. In most cases, stocks in yards are being steadily reduced. There is an inquiry here from a large automobile concern in Michigan for 1,000 tons of analysis iron, and another from a similar concern in the same district for 1,350 tons, both for third quarter delivery. Dealers, however, do not seem to be any too anxious to quote on anything running into the third quarter, owing to the unsettled condition of the market. Users are not generally asking for iron for shipment beyond next June for the same reason, being fairly well contracted for up to that time, and therefore sales and inquiries are mostly small and for practically prompt shipment. This can be given as one good reason, at least, why the market is so slow at the present time, and why it will probably not begin to improve to any extent until these contracts between buyer and producer commence to expire. A great deal of the business at the present time seems to be taken up with attempts of dealers to get the iron shipped on scheduled time, as the shortage of railway equipment and the inability of the railroads in general to handle shipments, sometimes develops into a serious problem. Consequently offices are daily receiving numerous complaints from customers to hurry their iron along. One dealer here reports sales last week aggregating 4,000 tons, which is fairly good, considering the state of the market at the present time. Southern foundry No. 2 is still being sold in some places in the south on a $10 Birmingham, basis, but in the Birmingham district direct, iron for this price seems to have disappeared, and $10.50 is being asked, and sales are being made there at that figure. Recent sales of northern No. 2 foundry show that $13 Ironton still prevails. Freight rates, $3.25 from Birmingham, and $1.20 from Ironton. We quote Cincinnati prices as follows:

Southern foundry No. 2	$13.25 to 13.75
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	13.75 to 14.25
Southern No. 2 soft	13.25 to 13.75
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.45 to 13.70
Jackson co. 8 per cent silicon	16.45 to 16.95

Coke. — Connellsville foundry coke has risen in price again during the past week, and can now be quoted at from $2.35 to $2.45 for both prompt shipment and contract for second half delivery. Some sales are being made at from $2.25 to $2.30, but for inferior grades only at this price. Furnace coke from the same district has also advanced slightly for prompt shipment, due probably to the fact that the congested condition on most railroads makes it impossible for furnaces to get coke contracted for on scheduled time, and being short of supply, they are willing to pay more for spot shipment. On the other hand, dealers cannot always supply the coke on short notice, which also has a tendency to raise the prices. Many users are now attempting to buy more than the usual requirements, as rumors of an approaching strike in the coal fields, which would cause a shortage of coke, has created a desire to store up enough to last for some time into the future, A sale of 150 cars of foundry coke during the past week is reported, but generally sales are for smaller lots for prompt shipment. We quote below the leading coke producing districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district.		
Foundry coke	$2.35 to 2.45	$2.35 to 2.45
Furnace coke	1.85 to 1.90	1.85 to 2.00
Wise county district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding scale basis.
Pocahontas district:		
Foundry coke	$2.00 to 2.10	$2.00 to 2.10
Furnace coke	1.65 to 1.75	1.70 to 1.90
New river:		
Foundry coke	$2.50 to 3.15	$2.60 to 3.25
Furnace coke	2.00 to 2.10	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Steel bars are generally reported a little firmer, and some fairly good sales have been made at 1.15c, Pittsburgh, although 1.10c has been done in some cases. Structurals are generally bringing from 1.15c to 1.20c, and the price of 2.80c on galvanized sheets, No. 28, has been advanced in most cases to 2.85c. Changes in the original plans of the new Union Central Life Insurance building, which is being erected in this city on the site of the old Chamber of Commerce, at Fourth and Vine streets, call for an addition of five stories, which will make the building 31 stories in all. This addition will be in the shape of a tower, which will gradually taper from the 27th story. It is estimated that the extra tonnage will be from about 400 to 500. We quote Pittsburgh prices on materials mostly used in Cincinnati, as follows:

MILL PRICES.

Steel bars, 1.10c to 1.15c; iron bars, 1.25c; tank plates, 1.10c to 1.15c; black sheets, No. 28 gage, 1.80c to 1.85c; galvanized sheets, No. 28, 2.85c; sheet, blue annealed, No. 10, 1.35c; structurals, 1.15c to 1.20c, all Pittsburgh basis.

The warehouse business seems to have improved all along the line during the past week. There seems to be about an equal demand for all materials generally carried in stock here, and some fairly good lots are being sold. Building in general will undoubtedly be better in Cincinnati during the coming spring and summer than last year, and business will probably improve proportionally as soon as the weather clears. We quote warehouse prices f. o. b. Cincinnati, as follows:

WARE HOUSE PRICES.

Steel bars, 1.60c base; iron bars, 1.55c to 1.60c base; structurals, 1.70c base; plates, ¼ inch and over, 1.70c base; sheets, blue annealed, No. 10, 1.90c base; rivets, cone head, 2.25 base; cold rolled shafting, 60% discount; boiler tubes as follows: 1¼ to 2¼ inch, 61 per cent discount; 2½ inch, 63 per cent discount; 2¾ to 3¼ inch, 66 per cent discount; 3½ to 4½ inch, 68 per cent discount; and 5 to 6-inch, 61 per cent discount; and soft steel cold twisted concrete bars, cut to length as follows: ¼ inch square and larger, 1.70c; ⅜ inch square and

larger, 1.80c; ½ inch square and larger, 1.90c; ⅝ to ⅞ inch square and larger, 2.10c; ¼ inch square and larger, 2.20c to 2.30c.

Old Material.—The only item of interest in the scrap iron market during the past week, was the purchase today of the plant and real estate of the old Licking rolling mill, at Covington, Ky., together with about 2,000 tons of scrap contained on the premises, by Hilb & Bauer, one of the leading firm of scrap iron dealers in Cincinnati, the price paid for all being $25,500. The new owners have not decided as to whether they will operate the plant, thereby making extensive improvements, or convert all the available material into scrap. Outside of this, the market is quiet and featureless, with no change in prices, although small fluctuations that do not hold are noted from time to time. Some recent small sales of stove plate brought from $6.50 to $7, and a sale of grate bars is reported at $6.50. There are no special lists, however, on which there is a better demand at the present time than for others, in fact there is hardly enough being sold to make a comparison. According to a summation of reports, prices are as follows:

GROSS TONS.	
Old iron rails	$12.00 to 13.00
Old steel rerolling	11.00 to 11.50
Old iron axles	18.00 to 18.50
Steel melting scrap	9.50 to 10.50
Car wheels	10.50 to 11.00
NET TONS.	
Old No. 1 R. R. wrought	$10.50 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 busheling	8.00 to 9.00
Stove plate	6.50 to 7.00
Machine shop turnings	5.50 to 6.00
Cast borings	4.50 to 5.00
Grate bars	6.00 to 7.00
Sheet iron, bundled	6.50 to 7.50
No. 1 cast scrap	10.00 to 10.50
Heavy turnings	6.00 to 7.00

PHILADELPHIA

Coal Troubles Interest Eastern Iron Men

Eastern markets continue to manifest irregularity in finished material prices and a slow expansion of volume, but sentiment is struggling to be more cheerful. Some plate orders originally placed with Pittsburgh makers have been cancelled because of slow deliveries and have been given to eastern mills instead, reflecting the filled-up condition of the middle western plants. Pig iron remains quiet. There is keener interest being manifested by blast furnace interests and industrial companies in general in the indications of labor troubles in the coal regions, April 1. Scrap conditions are inactive.

Pig Iron.—Makers are scanning the future more critically trying to gage the effects of a possible strike in the anthracite coal regions, April 1. Buyers, however, apparently see nothing in the outlook to arouse apprehension from their standpoint and the market continues to drag. Selling is light and is distributed in small lots. A Delaware river pipe shop continues in the market for 5,000 tons of No. 3 and forge for May-June shipment. Some makers are quoting $10, Birmingham, for No. 3 and $9.50 for forge on this business. These prices can be shaded, although low grade iron continues scarce in the south. The leading cast iron pipe company is sounding the market on northern low grade iron. Two buyers of malleable in this district are now inquiring for this grade, one for 1,000 tons up to July and the other for 500 tons for early delivery. It is reported western malleable has been quoted on this business at $15.35, delivered. Foundry iron conditions lack feature and are comparatively quiet. Some makers in the central part of the state are still quoting around $13, furnace, for 2X, but have been confining their operations principally to their local markets. The probabilities are some of these irons will become more aggressive market factors in this district in the near future. Eastern Pennsylvania makers are quoting over the range of $14.75 to $15.25, Philadelphia, and one or two of these furnaces sometimes shade the minimum. In Virginia, the West End furnace, which recently went into the hands of a receiver, has gone out and the trade is interested to observe the effect of this action, as this maker has considerable unfilled tonnage upon its books. It is expected that the placing of some sizable orders with other furnaces, particularly by the Virginia pipe shops, will result. The Virginia market continues $12.25 to $12.50, furnace for 2X. The eastern Pennsylvania basic market is stagnant. Some inquiry for this grade for export has been placed before sellers by middlemen. The eastern market is nominally about $14.25, delivered. Low phosphorus sales are small.

We quote for prompt and second quarter shipment in Philadelphia and vicinity, as follows, with local shipping and handling charges from docks included for Virginia and northern iron:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.00 to 14.25
Basic	14.25
No. 2X Virginia	15.50 to 15.75
No. 2 southern	14.50 to 15.00
Standard low phosphorus	19.00 to 19.25

Finished Material.—Despite the generally apparent softness to finished prices and the slow growth of volume, there is a little better sentiment to the eastern trade. This seems to be based upon the closer approach of the spring season.

Unstable prices rule in various lines. In shapes, some business in this territory has been entered by makers located outside the immediate district at 1.21c, delivered, equivalent to 1.06c. Pittsburgh. This quotation represents a shade under 1.10c at the selling mill which enjoys a less freight than the Pittsburgh district. Plate prices are being shaded on attractive lots but concrete cases show Pittsburgh mills are so well filled they are not able to satisfy all buyers as to deliveries. In one instance, a round lot of plates originally placed with a Pittsburgh maker were cancelled when it developed shipments were to be delayed and the business was placed with an eastern mill at its full asking price. Plate and shape prices are usually 1.10c to 1.15c, Pittsburgh, or 1.25c to 1.30c, Philadelphia, and bars at 1.10c, base, and 1.25c, delivered. The common quotation on bar iron is 1.15c, eastern mill, but this level is being shaded. Eastern sheet makers still endeavor to hold at a minimum of 1.40c, Pittsburgh, for 10-gage blue annealed, but this level is being shaded $1 a

ton by other mills. Standard spike prices are weak.

Henry Steers, Inc., New York, and the Brann & Stuart Co., Philadelphia, have the general contract for the concrete viaducts over the Bush and Gunpowder rivers, near Baltimore, for the Philadelphia, Baltimore & Washington railroad. The approximately 4,000 tons of steel bars have not been placed. Alternate bids for steel or concrete have been entered for the Delaware, Lackawanna & Western cut-off, near Scranton, but no decision has been announced. Bids went in this week for the Vendig hotel, this city, 1,600 to 1,700 tons, including 500 tons of Bethlehem columns. The McClintic-Marshall Construction Co. is low on the separate steel bid asked for the navy yard foundry, Washington, 1,000 tons. The Penn Mutual Life Insurance Co. is preparing plans for a large office building in this city.

A Nova Scotia steel company is inquiring of eastern makers for 3,000 to 5,000 tons of billets. Eastern mills are usually quoting rolling billets on the basis of $20, Pittsburgh, and forging billets at $25, Pittsburgh. Small lots predominate.

We quote for delivery in Philadelphia and vicinity as follows:

Structural shapes, 1.25c to 1.30c; steel plates, 1.25c to 1.30c; steel bars, 1.25c; common bar iron, 1.20c to 1.25c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage, 1.50c to 1.55c; 4 x 4-inch open-hearth rolling billets, $22.40 to $23.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburgh report.

Ship Building Work.—Pacific coast interests are figuring with eastern ship yards, for the construction of another unusually large boat for Panama canal traffic. The Pennsylvania Salt Mfg. Co. has placed, with eastern yards, three barges to require 1,000 to 1,200 tons of shapes and plates. Official announcement of the placing of the large boats for the Pacific Mail Steamship Co. is still withheld. Some eastern builders did not put in their bids on this work until March 1.

Old Material.—Eastern consumers continue to buy sluggishly. Special offerings are usually taken, but there is little buying on a tonnage scale in the open market. Direct buying from the railroads remains a principal source of supply and here consumers usually outbid the dealers. The monthly railroad lists are now up for consideration. Price levels at present offer no inducement for outside material to come in and local offerings are only moderate. Wrought pipe is higher, sales having been made at $12, delivered. We quote, delivered in eastern Pennsylvania and New Jersey consuming territory, as follows:

Old iron rails	$15.25 to 15.75
Old steel rails (rerolling)	13.00 to 13.50
No. 1 heavy melting steel	11.75 to 12.25
Old car wheels	12.30 to 12.50
Old iron axles	22.00 to 23.00
Old steel axles	17.00 to 17.50
No. 1 railroad wrought	14.25 to 14.75
Wrought pipe	11.75 to 12.25
Cast borings	8.25 to 8.75
Machine shop turnings	8.75 to 9.25
Heavy cast	12.50 to 13.00
Malleable	11.50 to 12.00
Stove plate	10.00 to 10.25

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

J. K. Dimmick & Co., Land Title building, Philadelphia, has been appointed sole sales agent for Emporium foundry pig iron manufactured by the Emporium Iron Co., Emporium, Pa. C. R. Dimm, formerly with the Philadelphia office of Crocker Bros., has been added to the Dimmick organization as a pig iron salesman.

ST. LOUIS

Fair Inquiry Follows Good Sale of Pig Iron

March 5.

Pig Iron.—A sale of 4,000 tons of pig iron the latter part of last week to a local melter by a local sales agent for shipment over the next six months, is the largest transaction that has taken place in the iron business for some time in the St. Louis territory. There is a persistent rumor afloat that a large steel foundry is quietly seeking prices on 15,000 tons of northern basic, although the report is not credited by some agents. An inquiry appeared in the mails this morning for 200 tons of northern iron, and another for 500 tons of Lake Superior charcoal car wheel iron, both of which will develop into sales within the next few days, it is believed. Southern No. 2 is still quoted at $10 to $10.50, Birmingham basis. Northern iron remains at $13 to $13.50, Ironton.

Prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.50 to 14.75
Southern No. 2	14.00 to 14.25
Southern No. 3	13.50 to 13.75
Southern No. 4	13.00 to 13.50

Coke.—Little or no inquiry for coke is in the market, and there is still some complaint that a shortage of cars makes delivery of coke on contracts somewhat difficult. Prices remain as follows:

We quote 72-hour Connellsville foundry grades, $2.15 to $2.40 for first half of 1912; 72-hour foundry, $2.15 to $2.25 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.75 to $1.80; best 72-hour Virginia foundry, $2.15 to $2.25; 48-hour Virginia furnace, $1.75 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material. — Transactions in scrap iron remain at a low ebb, with prices tending toward a reduction. Quotations are nominally as follows:

GROSS TONS.

Old car wheels	$13.00 to 13.50
Old iron rails	14.00 to 14.50
Re-rolling rails (5 feet and over)	12.00 to 12.50
Old steel rails (3 feet and under)	10.75 to 11.25
Light section relayers (45 lb. and under) subject to inspec.	20.00 to 21.00
Re-laying rails, subject to inspec.	23.50 to 24.00
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

NET TONS.

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs	9.00 to 9.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.75 to 9.00
Pipe and flues	7.50 to 8.00
Tank iron and cut boilers	7.00 to 7.25
No. 1 cut busheling	8.50 to 8.75
No. 2 cut busheling	6.00 to 6.25
Cast and mixed borings	5.25 to 5.50
Machine shop turnings	6.25 to 6.50
Railroad malleable	9.50 to 10.00
Agricultural, malleable	8.50 to 9.00
Stove plates	8.75 to 9.25
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	9.25 to 9.50

The Virginia Steel Co., Norfolk, Va., which has just acquired the old steel plant built a few years ago on the Eastern branch, will begin operations within a few days. The company will make steel and iron of the ordinary bar variety. Members of the company are Pittsburgh men.

BRITISH MARKET

News of the Great Strike by Cable and Mail

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., March 5.

(By cable.)

The threatened coal strike is complete. Thousands of factories have stopped, most iron works are closed and the rest will be idle by the end of the week. Iron masters expect the strike to last a fortnight. Prime Minister Asquith declared in parliament yesterday that the deadlock came about because the miners insist that mine owners accept the men's figures as a minimum wage, but the government thought the best way was to fix it by agreement in each district. The government will endeavor to do what it can and hopes this arrangement can be made.

Pig Iron.—Probably no industry is so keenly interested in the coal crisis as the iron and steel trade. At the present moment, public attention is concentrated on the colossal coal strike. Coal has already reached famine prices. The published house coal price in Birmingham today is 33s per ton, or about twice the usual figure. For some months past, transit difficulties have made the obtaining of fuel for current purposes a matter of difficulty, and the iron trade, therefore, is practically without any reserves for strike purposes. From end to end of the country, pig iron production must at once cease, the furnaces being either damped down or blown out. There are still the 500,000 tons of pig iron in Cleveland to fall back upon, but as the finished iron and steel works will also stand, this will be of little practical use. The prices of pig iron have been substantially unaffected by the crisis, so far. But enormous difficulties have been experienced in getting fuel, for the reason that the coal companies have naturally kept their fuel deliveries under old contracts at a minimum, to leave the largest surplus available at the present fancy prices. In the Middlesborough district, the selling price of warrants for No. 3 is 49s 6d ($12.06) with 49s 6d ($12.12) one month, and 50s 1d ($12.25) three months. Prices throughout Derbyshire and Nottinghamshire and the Midlands are practically unchanged. There is no new business in pig iron worth mentioning.

Warrant stock is being drawn upon heavily, and since the month opened there has been a reduction of about 5,000 tons. Very good shipments have been made for February.

Finished Iron and Steel.—In the finished department, the effect of the coal strike has been more directly felt in the diversion of orders from British to foreign mills. Makers of iron and steel are entirely unable at present to commit themselves, and wherever the requirements of customers are imperative, the order has to be placed abroad. A good deal of business has been lost in this way. Belgium will probably derive much practical benefit from the strike. Germany will be a bad second in this respect, as a coal strike is impending in the fatherland, owing to some remarkable demands put forward this week by the German miners. There has been talk of a sympathetic coal strike as the result of the International Miners' Conference now sitting in London. But the foreign delegates are careful to state that they have no powers in this direction, although it is likely that the continental miners will refuse to handle coal intended for Great Britain. At a great number of British iron and steel works, the men are on notice, with a view to the complete stoppage of operations, simultaneously with the closing of the pits. In regard to the pits themselves, the owners have intimated in some cases that if the pits close, they will never again be reopened.

Apart from the strike there is plenty of trade; any number of orders are waiting to be placed, and there is hardly an ironworks in South Staffordshire which has not three months' work on its books.

In the steel trade, there has been a little more foreign metal brought in during the last ten days, which may mean that the demand is not quite so brisk on the continent, although another interpretation, which finds some credence here, is that Belgium is giving an early intimation of her intention to cultivate the British market, to the fullest extent, during the coming strike. The British steel market is a shade easier, and the consumer is hoping that the maximum for billets, namely £5 5s to £5 7s 6d for Bessemer, and £5 10s to £5 12s 6d for Siemens has been reached, and that prices may now somewhat recede. If the end of the coal strike should come soon, this may prove a delusive hope, but the hopes of consumers have been stimulated a little by the news widely circulated through THE IRON TRADE REVIEW cable of a consignment of pig iron from America to Italy. There is an increasing belief that America may be looked to as a source of supply for raw and half-finished material, at a comparatively early date.

The ship building trade keeps enormously busy, so that a great deal of overtime is being made, both by ship builders and engineers, and this is likely to increase, as the days lengthen. In the west of Scotland, steel makers have been running under pressure. There is a very heavy demand for all kinds of steel, especially for heavy sections, on home order and for light section of export account. A large quantity of armor plate and ship plate generally is being turned out. Manufacturers are very well booked, and not at all eager for new business. An enormous export trade is being maintained to India, Japan, New Zealand and Australia, while South America is an exceptionally good market. Structural business has distinctly improved lately, largely as the result of plant extensions.

Meeting is Arranged

The next meeting of the administrative council of the National Metal Trades' Association will be held Wednesday, April 10. The council will adjourn from 12 to 2 for the purpose of discussing its labor bureaux at luncheon with presidents and secretaries of the association's local branches. On the evening of the same day alumni members will hold their regular dinner, and on the following day, at 9 a. m., the fourteenth annual convention will be called and an interesting session held. On that evening the convention banquet will take place and three of the best informed men on live subjects will speak. The sessions, banquet and luncheon will be held at Hotel Astor, New York City.

Birmingham

Higher Schedule Maintained in Southern Sales.

Birmingham, Ala., March 4.

Pig Iron.—This market has been very quiet since last report, and only a limited tonnage in the aggregate is reported sold. In the sales made during the past week, a schedule of $10.50 per ton, Birmingham, for No. 2 foundry is believed to have been fully maintained, but the buying was largely confined to southern territory, and requirements in each individual cases were small. The demand for low grades has predominated for some weeks past, and has practically depleted the available stock. At this time some tonnage of No. 4 foundry and gray forge is pending, owing to the inability of the producing interests to promise delivery within the period stipulated. Recent offers of $10.25 and $9.75 per ton, Birmingham, for Nos. 2 and 3 foundry, respectively, have been refused, and efforts to place tonnage for last half delivery at a $10.50, Birmingham, basis were unsuccessful. As the situation is now presented, the producing interests are making shipments at a rate in excess of the daily output, and are content to await further developments. It is pointed out that a very significant percentage of the capacity now in operation has been provided with orders for the output during the remainder of the first half, and that the provision that has been made in certain quarters of the trade is comparatively limited. There was no unusual effort made by local interests to secure the tonnage recently offered for export; but aside from the requirement of a pipe manufacturer, which consists principally of low grades, the new business actually in sight is small. Shipping instructions for the present month that have been received so far do not indicate a smaller melt. There is still some complaint of the inability to make delivery against contracts at the rate originally agreed upon, although considerable of the tonnage brought over on order books from 1911 has been cleaned up. The offerings of basic iron have not increased, and the price being asked for such grade is in line with the current quotation for No. 2 foundry. For warm blast charcoal iron, a basis of $22.50 to $23, at furnace, is being asked for the chilling grades. The aggregate of all stock accumulation as of March 1 will hardly be known before the 10th inst., but no change has been made in the rate of furnace production since Feb. 1. Quotations on all grades, for delivery in the first half, are as follows, per gross ton, f. o. b. cars here, viz.:

No. 1 foundry	$10.75 to 11.25
No. 2 foundry	10.25 to 10.75
No. 3 foundry	9.75 to 10.25
No. 4 foundry	9.25 to 9.75
Gray forge	9.50 to 9.75
Mottled	9.25 to 9.50
Standard basic	10.25 to 10.75
Off basic	10.00 to 10.50
Standard charcoal	22.50 to 23.00

These prices are per gross ton f. o. b. cars at Birmingham district furnaces.

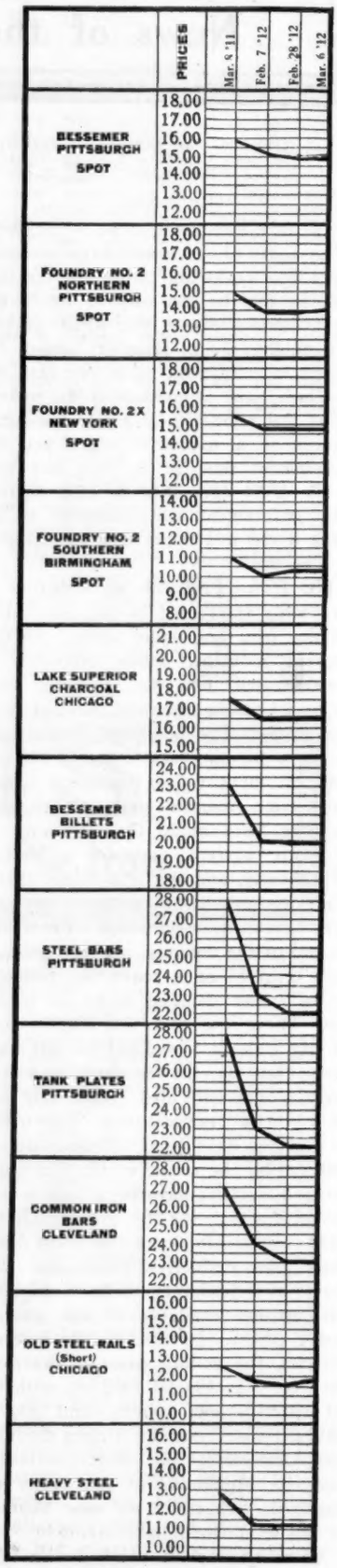
Cast Iron Pipe.—With more favorable weather conditions, shipments against all contracts are being made at a more satisfactory rate. The movement to the northwest has been increased very materially, and within the week some additional tonnage from that territory was submitted for consideration. Probably the largest proposition before the producing interests at this time is the requirement of 36-inch pipe for the city of Chicago. The specifications for this tonnage are not yet in hand, but it is understood that some 11 miles of water main will have to be provided for. The tonnage placed since last report consists principally of small lots for municipal improvements. We quote water pipe, per net ton, f. o. b. cars here, as follows, viz.: 4 to 6 inches, $23; 8 to 12 inches, $22; over 12 inches, average $21, with $1 per ton extra for gas pipe. These prices are probably shaded for large municipal contracts.

Old Material.—Quotations on certain grades are revised, and the market is generally considered stronger. The movement in small quantities to southern mills aggregates a fairly attractive tonnage, while local foundries have taken a very liberal tonnage of machinery cast as a substitute for low grade pig iron. Investigation develops the fact that large quantities of wrought and steel scrap have been accumulated in certain sections of the territory adjacent to this market, but such accumulations are being held for higher prices. The accumulations on dealers' yards do not increase. We revise dealers' asking prices as follows, per gross ton, f. o. b. cars here, viz.:

Old iron axles, light	$12.00
Old steel axles, light	11.50
Old iron rails	12.50
No. 1 R. R. wrought	11.00
No. 2 R. R. wrought	9.50
No. 1 country	6.50
No. 2 country	6.00
No. 1 machinery	9.50
No. 1 steel	8.50
Tram car wheels	8.50
Standard car wheels	10.00
Light cast and stove plate	6.00

The Virginia Steel Corporation, Seaboard Bank building, Norfolk, Va., recently incorporated with $50,000 capital stock, will lease a plant on the Elizabeth river. The officers are: President, John Robinson; vice president, John Robinson Jr.; secretary, L. B. Deisenwroth, all formerly of Pittsburgh.

PRICE CHART



Seattle

Chines Iron to Various Plants. Effect of Freight Reduction.

March 1.

Structural steel both of eastern and local make has been moving much more rapidly in the past week than at any period since the close of active building operatings last fall. Large orders for structural steel have been placed with eastern manufacturers and shipments on orders made during the winter are now arriving on the coast. Some of the smaller orders are being filled by local mills.

The rumored rehabilitation of the Western Steel Corporation plant at Irondale, is discountenanced by several large shipments of Chinese iron, which has been held pending the decision of the assignee regarding the resumption of business. Not a little of the iron, which was in stock at the time the plant closed down, has been sent to San Francisco, while some has been taken over by local mills and foundries.

A feature of the week's export business has been the exportation of large consignments of ship building steel beams, bars and plates to Japan. This in addition to the railroad steel, which is being taken by oriental lines, gives the current months a new record in steel exportations.

The ship building steel is being billed to Kobe, Japan, by eastern mills. Large consignments of railroad steel are also passing through this port for the orient.

Pig Iron.—The proposed reduction of freight rates to take effect the second week in March on Alabama and Tennessee pig iron is having its effect on the foreign irons. Under present conditions, the higher grade English irons are able to compete with the eastern American pigs, but importers are disposing of what they have at terms which meet the prices which will prevail when the new rates take effect. The present rate of $10.44 will be cut to $8.96. This will permit eastern furnace men to lay down the best Alabama and Tennessee pig iron at figures which will be prohibitive to importers in the future, except when small lots are brought in as ballast for coke ships.

	Prompt.	First Quarter, 1912.
No. 1 Glengarnock	$24.00 to 25.00	25.00
No. 1 Eglinton	23.50 to 24.00	24.00
No. 1 English Jarrow	22.50 to 23.00	23.00
No. 1 Cleveland	23.00 to 23.50	23.50
English Doncaster	22.50 to 23.00	23.00

Coke. — Several good sized shipments of Connellsville coke have been received from the east in the past week and it has the call over some of the better imported brands even at higher prices. The German syndicate and Plean cokes are reported to be meeting with a sluggish market, small consignments being the rule. Native cokes at $6.50 at the mines are meeting with fair demand from manufacturers who are not needing the light ash varieties.

Old Material.—Old material of various grades is having steady movement with but little or no change in price. An increase demand has had the effect of raising the high class scrap, prices ranging from $14 to $16. Ship building firms are working over the higher class of old material which can be used in minor construction. Yards on the Sound have received orders for a number of whaling ships in the past week and the construction of these vessels is being hurried.

Iron rails	$14.00 to 15.00
Rerolling steel	14.00 to 14.50
Old axles	19.50 to 20.00
Car wheels	12.25 to 13.00
Smelting, scrap	11.50 to 12.00

METAL MARKETS

St. Louis

March 4.

Lead and Zinc.—A price of $52 a ton for zinc, on a basis of $49 for 60 per cent qualities, was realized in the Missouri - Kansas - Oklahoma district last week. From this, the base price ranged down to $45 a ton. Calamine brought $30 a ton on an assay base of $27 for 40 per cent grades, ranging down to $24 a ton base. Lead ore was strong at $55 a ton.

Chicago

March 5.

New Metals.—Buying is fairly heavy and prices are moving within comparatively narrow limits. The copper market is firm and active. Lake copper is now standing at 14¾c, Chicago, with the casting grade ½c lower. Spelter prices showed no change during the week, although the market was firm. Tin is now quoted 43½c, Chicago.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 14¾c; casting, 14¼c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.55c; lead, desilverized, 4c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8.25 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 43½c. Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—The demand for old metals is somewhat better and prices are a little firmer. The actual results of business, however, are not altogether satisfactory to dealers, the margin of profit being very narrow.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13c; copper bottoms, 11½c; heavy cut crucible copper, 13c; heavy red brass, 11¾c; heavy yellow brass, 9½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8¼c; brass clippings, 8½c; lead pipe, 3c; zinc scrap, 4c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 39c; tin foil, 32c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $80 to $85 a ton.

New York

March 5.

Tin.—The domestic market was surprised with a higher range of prices sent over from London today. It is not considered significant of anything more than the syndicate's grip on the tin situation, and only occasioned surprise because of the apparent unpropitious time. There has been a good demand in this market for tin since last Thursday, and it is estimated that approximately 1,000 tons have been taken by consumers in that time. Spot is held at 43.62½c today, and March at 43.50c. The United States Steel Corporation has been the most important buyer. Arrivals since March 1 aggregate 3,034 tons, and there are 2,690 tons afloat.

Copper. — Leading domestic consumers have bought freely the past two weeks, and most producing interests claim to have order books well filled for two months ahead. The price of electrolytic has been advanced to 14.50c, delivered 30 days by all interests, and one or two prominent sellers are practically out of the market at under 14.62½c. Lake is 14.62½c to 14.75c, and casting is 14.37½c.

Lead.—The American Smelting & Refining Co. continues the cheapest seller of lead at 4c in New York. Other sellers are offering at 4.10c. The demand has subsided somewhat.

Spelter.—Scarcity of spelter is the conspicuous feature of the market. The shortage in supply has caused an advance in spot to 6.90c. Prime western for prompt shipment from the west is only available in small quantities, at 6.87½c.

STEEL FOUNDRIES

Purchases Land and Stock—President Kelley Submits Report.

The balance sheet with a statement of profit and loss for the ninth fiscal period of the American Steel Foundries ended Dec. 31, 1911, has been submitted to the stockholders. The report covers 17 months, and begins Aug. 1, 1910. It was arranged this way in order that the end of the company's fiscal year and period might coincide with the government's annual report requirements, as well as for other reasons.

Gross sales were $14,300,562.01, or at the rate of $10,094,514.36 per year, as compared with $17,173,740.98 for the preceding year. The net loss for the 17 months was $259,030.92, and the deficit was $224,518.71. Bonds to the amount of $68,100 par value were retired, making the total retired, or provided for, $1,343,000, out of the original issue of $3,500,000. The property account during the period increased $234,831.76.

President William V. Kelley points out the following, among other things:

"The result of the lack of buying by railways and generally depressed business conditions, both due to conditions with which the public is familiar, was that the steel casting plants of this company were only able to operate an average of 50 per cent of their capacity during the entire period of 17 months and during six of the months at 40 per cent or less, one month dropping to 32 per cent; while the Hammond works, which is devoted entirely to railway material and usually one of our best earners, was only able to run at 30 per cent of its capacity during the entire time, and during four months below 20 per cent, and for one month at only 12 per cent. At times there was only a week or ten days work ahead for any of the works which, in a business of this character, means that operations were practically at a standstill."

The company purchased some land adjoining its Indiana Harbor plant and acquired nearly the entire capital stock of the Continental Railway Equipment Co. Orders on hand are larger than at any time since the beginning of the period covered in the report, but prices like those in other lines of steel manufacture are declared to be unsatisfactory. A liberal buying movement, improving prices and increasing the output is hoped for, however.

The profit and loss account for the 17 months follows:

Earnings	$697,610.53
Other income	59,492.75
Total income	$757,103.28
Deduct:	
Interest	$683,498.00
Depreciation	332,636.20
Balance—net loss	$259,030.92

DEPOSIT CERTIFICATES

Sheffield Coal & Iron Co. Requests Stockholders to Settle Difficulty.

The committee appointed to devise a plan for settling the difficulties of the Sheffield Coal & Iron Co. sent a circular letter to stockholders on March 1, requesting them to deposit their certificates with the Bankers Trust Co., New York, and stating that the company's furnaces at Sheffield, Ala., are not now in operation. The Stonegap Colliery Co. is mining coal and the Wise Terminal Co. operating its railroad, both being subsidiaries of the Sheffield company. The company was unable to meet a bond payment of $63,580, due Jan. 1, 1912. An issue of notes aggregating $82,000 will also mature on April 1. The committee has not decided what plan to submit to stockholders.

S. T. Wellman Opens Offices

S. T. Wellman and his son, H. G Wellman, Cleveland, have formed a partnership to be known as S. T. Wellman & Son, with offices at 8803 Euclid avenue, for the purpose of doing steel works engineering. Mr. Wellman Sr. has returned from California, whre he spent the last four years, partly for rest and recreation and partly for business, in the meantime doing considerable steel works engineering. The firm will make a specialty of open-hearth steel plants with their accessories, furnishing plans and specifications, securing bids, inspecting and superintending erection, etc. The business will be along lines separate from that of the Wellman-Seaver-Morgan Co., of which Mr. Wellman Sr. is still chairman of the board. Forty-two years ago Mr. Wellman designed and built the open-hearth steel plant of the Bay State Iron Works, in South Boston, which was the beginning of the open-hearth steel industry on a commercial basis in America. He has since been constantly identified with the development of open-hearth processes and machinery.

DENIES IMPUTATION

Of Government in Regard to Destroying Old Papers.

The United States Steel Corporation this week made public its answer to the petition of the government for a permanent injunction to prevent the destruction of books and papers which might be wanted by the authorities in their investigation of the Corporation. The government's action grew out of the destruction of a trunkfull of papers used by the federal authorities in the so-styled "wire pool" cases and then returned to the Steel Corporation.

In the answer the Steel Corporation says that the papers were destroyed after having been submitted to the grand jury and through ignorance that they would be wanted again. The Corporation disclaims any attempt to conceal papers and denies the imputation that it was about to destroy papers wanted by the government in the pending suit. Accompanying the answer are the sworn statements of Charles MacVeagh and Raynal C. Bolling, of the Corporation's counsel, and of Frank Baackes and George A. Cragin, of the American Steel & Wire Co. Mr. Baackes ordered the destruction of the papers. The answer was not filed owing to the recent death of Judge Lanning, of the federal court of New Jersey, but was handed to a government attorney and then made public

Steel Prices Advanced

Cincinnati, March 6. (By wire.)—The local mill today withdrew all prices on sheets, making an advance of from $1 to $2 a ton over former prices. The advance on galvanized is due to the heavy advance in spelter and to increased demand for the galvanized as well as black and blue annealed.

The New York store of the Cleveland Twist Drill Co., Cleveland, has been removed from 62 to 30 Reade street, where larger and more commodious quarters have been obtained and the floor space is practically double that of the storeroom previously occupied.

The Thomas Furnace Co., Milwaukee, has contracted with the Variety Iron & Steel Works Co., of Cleveland, for a steel bridge electrically equipped for handling a 6½-ton bucket. The bridge will have a capacity of about 250 tons an hour.

Pig Iron Production Increased in February

Output 45,990 Tons Greater Than in January in Spite of Short Month.—Daily Average Largest in 20 Months

The total output of coke and anthracite pig iron of this country during February, as compiled from complete returns, was 2,098,796 tons. This was the largest monthly production since March, 1910, and compares with 2,052,806 tons in January, an increase of 45,990 tons. The increase becomes more apparent in the average daily production, 72,372 tons, which shows an increase of 6,152 tons over January's daily average, 66,220 tons. February's daily average was the largest since June, 1910.

MONTHLY PRODUCTION.

	1912.	1911.	1910.
January	2,052,806	1,766,658	2,599,995
February	2,098,796	1,781,285	2,429,525
March		2,165,764	2,588,736
April		2,044,904	2,477,700
May		1,871,388	2,374,802
June		1,773,282	2,288,279
July		1,776,108	2,158,124
August		1,921,832	2,103,793
September		1,973,918	2,048,461
October		2,092,061	2,086,205
November		1,999,100	1,910,385
December		2,032,301	1,779,899
Total	4,151,602	23,198,601	26,845,904

The output of non-merchant or steel making iron in February was 1,519,215 tons, compared with 1,466,943 tons in January, an increase of 52,272 tons. That of merchant iron was 560,754 tons, compared with 557,311 tons in January, an increase of 3,443 tons.

The production of spiegel in February was 2,915 tons, compared with 6,423 tons in January, a decrease of 3,508 tons. February's output of ferro was 15,912 tons, compared with 22,129 tons in January, a decrease of 6,217 tons.

Stacks in blast on the last day of February numbered 236, compared with 227 the last day of January, an increase of 9. The gain was distributed as follows: Two steel works stacks in Illinois, one merchant stack in New York and five steel works stacks in Ohio. Four steel works stacks were also blown in in Pennsylvania, but this was almost entirely offset by the blowing out of three merchant stacks.

AVERAGE DAILY PRODUCTION.

	1912.	1911.
January	66,220	58,989
February	72,372	63,617
March		69,863
April		68,163
May		60,367
June		59,109
July		57,294
August		61,995
September		65,797
October		67,486
November		66,637
December		65,558

New Birmingham Rates.—As stated in THE IRON TRADE REVIEW of Feb. 8, a new freight tariff from the Birmingham district to the Pacific coast will go into effect on March 11. The new rate on pig iron to California has increased 8 cents a ton, while to north Pacific points the new rate is $1.98 a ton lower. The north Pacific rate on coke is unchanged, but the California rate is increased $1.50 a ton. The Birmingham rate will be the same as the Duluth rate after March 11, $8.96 per ton.

The Columbian Iron Works, Chattanooga, Tenn., has increased its capital stock from $125,000 to $300,000.

States.	No. of stacks.	No. in blast last day of month. Feb.	Jan.	Total tonnage made. Merchant.	Non-Merchant.	Totals. Feb.	Jan.
Pennsylvania	158	98	97	170,312	736,877	907,189	879,257
Ohio	71	51	47	119,618	391,342	510,960	480,443
Alabama	45	18	18	105,877	32,229	138,106	146,212
Virginia	24	8	7	25,978	.....	25,978	24,327
New York	28	14	13	54,375	62,948	117,323	118,524
New Jersey	7	..	..	.....	.....	.....	.....
Illinois	24	16	14	20,309	133,969	154,278	164,230
Colorado	6	3	3				
Indiana	9	8	8				
Maryland	4	3	3				
Wisconsin	6	4	4	24,569	136,100	160,669	149,480
Kentucky	7	1	1				
West Virginia	4	3	3				
Tennessee	18	7	7				
Washington	1	.	.	28,490	25,750	54,240	48,781
Georgia	2	.	.				
Texas	3	.	.				
Minnesota	1	.	.				
Michigan	3	2	2				
Missouri	1	.	.	11,226	.....	11,226	13,000
Spiegel—All states						2,915	6,423
Ferro—All states						15,912	22,129
Totals	422	236	227	560,754	1,519,215	2,098,796	2,052,806

TALKS PROSPECTS

Report of Chicago Railway Equipment Co. for 1911.

The Chicago Railway Equipment Co. in its report for the fiscal year ended Dec. 30 last, shows a profit and loss surplus of $457,243, as compared with $523.027 at the close of the previous year and $401,719 in 1909. Dividends paid during the year amounted to $173,950.

The report points out conditions surrounding the business and kindred industries, which, it says, have not only continued from 1910, but have been keenly accentuated throughout the year 1911. Chief among the conditions, and of most immediate and direct effect upon the railroads, it is shown, was the then pending question of freight rates and the refusal of the interstate commerce commission to allow the companies to increase their revenue. This, the report, resulted in all plans for new equipment to be abandoned, causing complete stagnation.

"There are many encouraging features, however, looking toward future business," the report says. "It is the general consensus of opinion that, with some of our national problems solved, and a consequently more stable condition of business established, the railroads must of necessity become buyers of equipment on a highly augmented scale."

Furnace Contracts Let

The Northern Iron Co., Port Henry, N. Y., through its engineers, Frank C. Roberts & Co., Philadelphia, has awarded contracts in connection with its new blast furnace as follows: Union Boiler & Mfg. Co., Lebanon, Pa., plate and structural work; Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., castings.

The National Roll & Foundry Co., Pittsburgh, has taken an order for a bar mill and tables from Follansbee Bros. Co., for the latter's plant at Follansbee, W. Va. The company is also working on an order for cold mills for the same buyer. The new bar mills are to be completed in June.

ADVANCE IN SHEETS

Results in Higher Prices for Galvanized Sheets and Pipe.

Steady advances in the price of spelter at East St. Louis have finally resulted in higher quotations on galvanized sheets and on galvanized wrought iron pipe being made by independent makers. The price of spelter, prime western brands, yesterday was 6.60c, while in the outside market at New York, the price was 6.97½c, the freight from East St. Louis being 15 cents per 100 pounds.

One middle western maker of galvanized sheets has advanced his price $1 and $2 a ton.

An eastern wrought iron pipe maker announced to the trade an advance of from 1 to 6 points in galvanized pipe from the small sizes upward and on both butt and lap-weld. This is equivalent to an advance of $2 to $12 a ton.

Bartlett & Snow to Make Extensions

The C. O. Bartlett & Snow Co., Cleveland, which recently increased its capital stock from $60,000 to $500,000, advises that the increase is to provide for some extensions to its business which may include a foundry. It is further planned to permit employes to become stockholders in the company and a portion of the new stock will be set aside for this purpose. A profit sharing plan may also be worked out later. Although the company formerly confined its operations to the manufacture of oat meal, barley pearling and general mill machinery, it has now extended its line to embrace all kinds of elevating and conveying equipment; complete installations for coal mines, coal docks, etc., mechanical dryers, gravel and sand handling and washing plants, garbage disposal plants, etc. A large export business, especially in Mexico, Canada and South America, has also been developed in these products. The officers are: President and treasurer, C. O. Bartlett; first vice president, H. H. Bighouse; third vice president, H. L. McKinnon, and secretary, I. M. Snow.

Large Contract for Plates and Bars Reported

New York, March 6. (By wire.)—The New Jersey Zinc Co. has placed 4,000 tons of shapes with the Jones & Laughlin Steel Co. for new construction at its Illinois plant. It is reported that the Lackawanna Steel Co. has taken 18,000 tons of plates and bars for a western manufacturing consumer.

Joe Ford Dead

Joseph Ford, president of the Spring Lake Iron Co., with a charcoal furnace at Fruitport, Mich., and also president of the Mitchell-Diggins Iron Co., with a furnace at Cadillac, died March 5, at Grand Rapids, aged 60 years.

Orlando C. Gale, aged 88, founder of the Gale Mfg. Co., one of the largest plow and farm implement concerns in the country, died at his home in Albion, Mich., on Feb. 29, following a week's illness. He was prominently identified with the agricultural implement world, being one of its best known pioneers. Mr. Gale was a leading citizen of Albion and took an active interest in its welfare.

SMALL SURPLUS

Earned by Lackawanna Steel Co—Complete Report Issued.

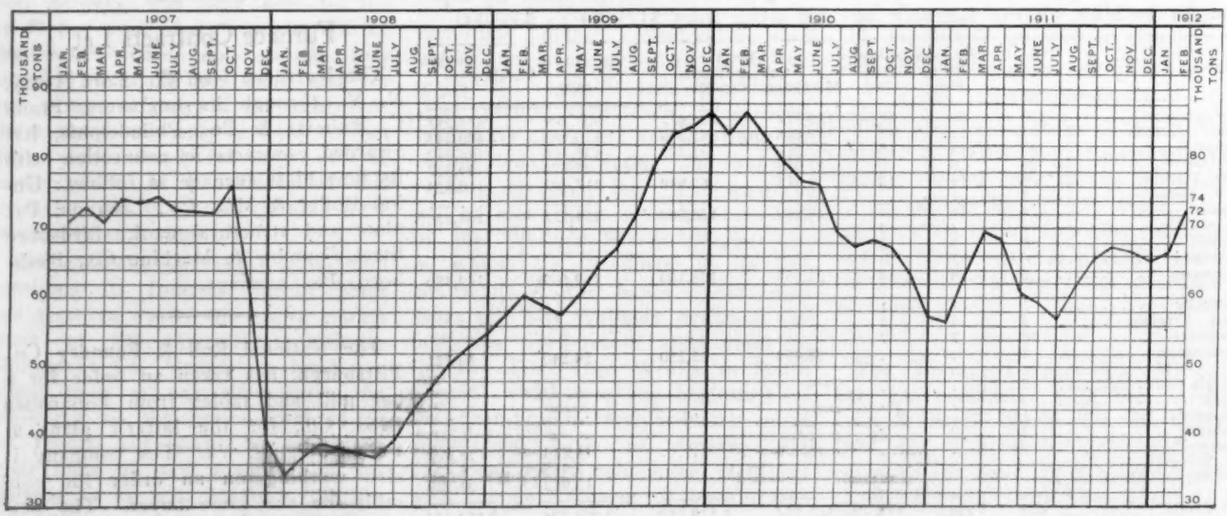
In the complete annual report of the Lackawanna Steel Co., just issued in pamphlet form, President E. A. S. Clarke informs his stockholders that the average price received by the company for its products in 1911 was $27.67 per gross ton, or $1.25 per ton less than the corresponding price for 1910. This price, together with reduced shipments and a greater cost of operation over former years, accounts for the reduction in earnings the past year, he says. President Clarke pronounces the year, as a whole, unsatisfactory, although there was an increase in business the second half.

Continuing further in his review of the year, President Clarke says: "Your company received during 1911, from mines which it owns, or is interested in, and from other sources, 987,314 gross tons of iron ore, and produced a total of 844,829 gross tons of coke and 735,980 gross tons of pig iron. It also produced 345,038 gross tons of Bessemer ingots, and 453,214 gross tons of open-hearth ingots, a total of 798,252 gross tons of steel ingots of all kinds."

The profit and loss and income accounts for the year ended Dec. 31, 1911, shows the following:

	1912.	Decreases.
Gross sales	$21,040,386	$10,262,373
Operating expenses	17,394,307	7,577,982
Net income	3,646,080	2,684,391
Discount	584,913	400,146
Total income	4,230,993	3,085,537
Gen. expenses	739,515	134,666
Net earnings	3,491,478	2,950,871
Int. on bds.	2,206,436	15,905
Balance	1,285,042	2,934,966
Depreciation	1,202,239	484,664
Surplus	82,803	2,450,302
Prev. surplus	3,747,704	266,895
Total surplus	3,830,507	2,717,197
Discount	.....	2,800,000
Final surplus	3,830,507	*82,803

*Increase.



DAILY AVERAGE OUTPUT OF COKE AND ANTHRACITE PIG IRON BY MONTHS

The Sintering of Fine Iron-Bearing Materials[1]

Results Obtained by the Dwight & Lloyd Sintering Process at the E. & G. Brooke Iron Co's. Plant

By B G Klugh

The purpose of this paper is to present a discussion of some of the technical details involved in the operation of the plant installed at the blast furnace of the E. & G. Brooke Iron Co., Birdsboro, Pa., for the purpose of sintering fine iron-bearing materials by the Dwight & Lloyd process. The theoretical and practical relations of this product to blast furnace practice also will be considered. This plant has been in operation since Oct. 1, 1911, with highly satisfactory results, although the material treated, being chiefly the flue dust currently made by the furnace or taken from the accumulated stock pile, was excessively high, and yet not uniform in carbon, so that the desirable control or regularity of the amount of fuel in the mixture treated could not be maintained. Nothing could more forcibly demonstrate the flexibility of the process than the fact that, under these conditions, the sinter produced was, in all cases, of excellent quality.

According to the principle of the process, the finely-divided iron-bearing material to be sintered is intimately mixed with the amount of carbon requisite to produce the sinter. This mixture is then moistened and deposited upon the machine in a uniform layer, the upper surface of which is ignited by a small flame of intense local heat, and the combustion of the intermixed carbon is effected in a progressive downward course by a current of air flowing in the same direction through the permeable mass. The energy from the combustion of each particle of carbon is expended and utilized directly upon the adjacent particles of iron-bearing material, agglomerating them into a coherent sinter.

In other words, the Dwight & Lloyd sintering machine is a piece of chemical apparatus in which to carry out the reaction between the oxygen of the continuous supply of air and the solid combustible material of the charge. The former is maintained in a zone of regular and continuous supply moving in the direction of gravity. The latter is, of course, intimately mixed with the material to be sintered. It logically follows that the capacity of the machine is limited by the weight of carbon burned per unit of time. It has been found that an amount of carbon equivalent to 8 per cent of the weight of the ore to be sintered furnishes ample heat for the production of the sinter. Carbon in the mixture in excess of 8 per cent performs the wasteful and deleterious functions of consuming proportionately longer time for its combustion; raising the temperature of the sinter produced to its fusing point, thus enveloping unconsumed carbon, and raising the temperature of the grate-bars and other parts of the machine. Besides which, the minimum consumption of carbon, consistent with maximum production and most desirable quality of product, is desirable for economic reasons.

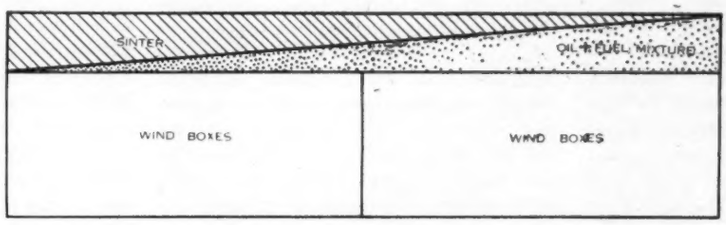


FIG. 1—DIAGRAM SHOWING ARRANGEMENT OF MATERIAL IN THE ACTIVE ZONE

From a given material, properly mixed with the correct percentage of fuel, the character of the sinter produced depends wholly upon the material itself, being unaffected by the speed of sintering or velocity of air supply; but its amount per unit of time depends upon the rate of combustion of the intermixed fuel, which, in turn, depends upon the rate at which the oxygen is brought into contact with fresh fuel, as the inert products of combustion are taken away by the action of the fan.

Thus we come to the principle that the permeability of the bed of material, and the pressure-drop between the atmosphere outside and that in the wind box determine—other conditions remaining constant—the rate of the production of sinter.

Permeability is largely influenced by the moisture added. The function of the water is not entirely understood. Primarily it causes a temporary agglomeration of the particles of the materials, thus preventing them from passing through the grates. The voids in the bed are then larger, offering less resistance to the gas current. It

[1]Presented at the New York meeting of the American Institute of Mining Engineers, Feb. 19 to 21, 1912.

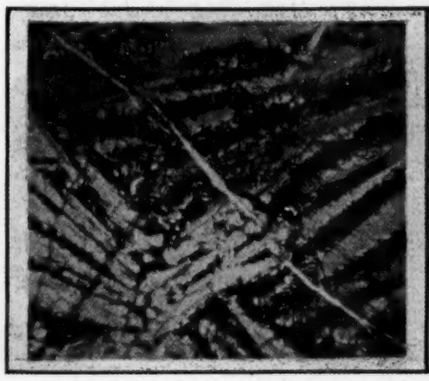


FIG. 2—HEATING CINDER

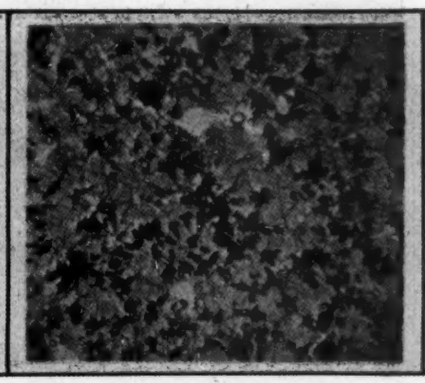


FIG. 3—PUDDLE CINDER

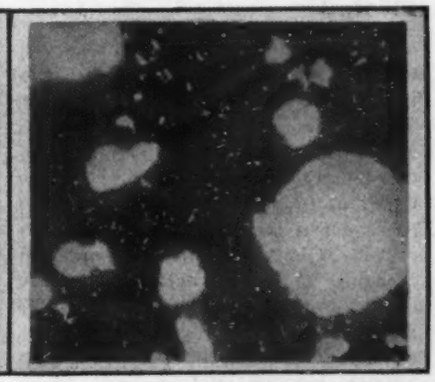


FIG. 4—FLUE DUST CINDER

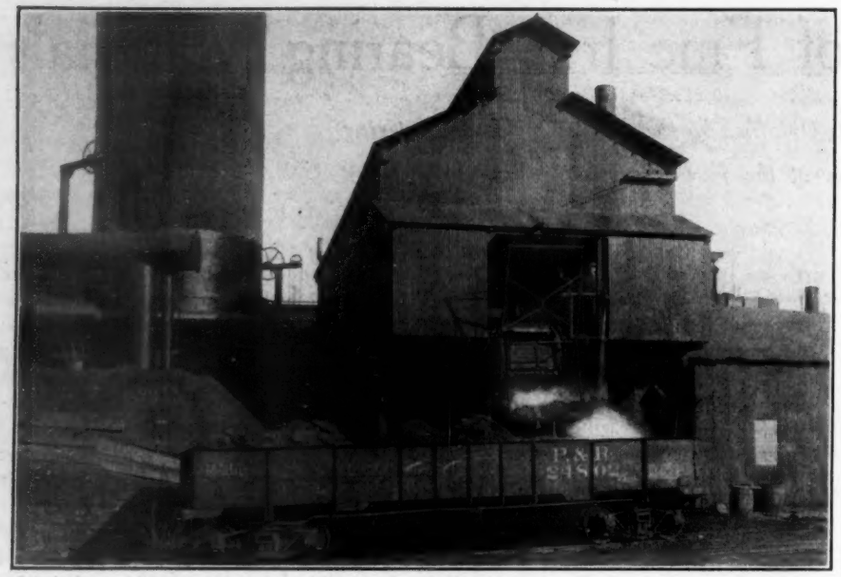


FIG. 5—DISCHARGE END OF FLUE DUST CONVEYOR AND FINE ORE-SINTERING MACHINE

must be borne in mind that the amount of added moisture is not a given percentage by weight, but the quantity required to produce a certain degree of plasticity. For instance, to a fine hematite there could be added 15 per cent by weight of water, before the material would cohere properly; but with magnetite, 4 per cent of added water produces the equivalent degree of plasticity. The regulation of this phase of the process, which is doubtless very important, has as yet been determined by rule-of-thumb only. This is done very well by workmen after a small amount of practice, especially upon a given material.

The diagram, Fig. 1, shows the relative arrangement of the product and crude material in the active sintering zone. The rectangle represents a vertical cross-section through the pallets over the wind box. The sinter and ore mixture are seen to be separated by an imaginary line beginning and ending at two respective zero points. This is about the state of all materials. When high-carbon materials are sintering, the combustion of the carbon proceeds downward, progressively. Should high carbon follow low carbon directly, the only adjustment necessary is to slow down the speed of the pallets, allowing greater time for burning out the excess of carbon. The only condition under which residual carbon is left in the sinter is when the temperature of the sinter in the upper part of the bed is raised, so as to render it incipiently fluid, and permit it to envelope small amounts of carbon. This only occurs when the carbon is excessively high, say, above 20 per cent.

There have been practically no high-sulphur materials treated which were not brought down as low in sulphur as the best Lake ores. No special adjustment or preparation of the ores is necessary to effect desulphurization; the sulphur is eliminated simultaneously with the sintering. The desulphurization is not dependent upon the form or quality of the ore. Pyrites sinter has been brought down from 4.41 to 0.07 per cent, while magnetites have been lowered in sulphur from 3.50 to 0.15 per cent.

An analogy between the sinter made has been suggested by the Dwight & Lloyd process and mill cinder. No such comparison is practicable. The two materials are wholly different in origin and appearance. Whenever mill cinder or puddle cinder has a small amount of entrapped gases, producing pores, the walls of the pores are glazed and impervious to gases. In fact the material is a glass, which has been completely liquid. The Dwight & Lloyd sinter, made under normal conditions, has never approached the liquid state, and hence its particles are united by plastic coherence of their surfaces; and the cell walls have the microscopic porosity of easily reducible ores. The micro-photographs shown in Figs. 2, 3 and 4, very forcibly show the distinction between the structures of the cell walls of the different materials.

Fig. 2 shows a section of heating cinder magnified 40 diameters. Fig. 3 shows puddle cinder of the same magnifications. Both these materials have been cooled from a liquid state. By its method of formation the former approaches more nearly a theoretical ferro-silicate. The latter, although containing practically the same chemical compound as the former has a different proportion of the same constituents. The heating cinder is further subjected to slower cooling and hence allowed more opportunity for perfect formation of the crystals. The translucent and glass-like structure of the silicate of iron is shown in each case entirely enveloping the excess of oxides of iron, which is shown opaque in each of the two cases. On the other hand, the section of Dwight & Lloyd sinter, Fig. 4, shows none of the translucent silicates. But there is shown a uniform opaque mass indicating none of the glassy, silicate formation, which is characteristic of the two types of mill cinder.

The pores in the Dwight & Lloyd sinter are shown, all having the irregular lines forming the walls of the cells. When it is borne in mind that this section is magnified 40 diameters,

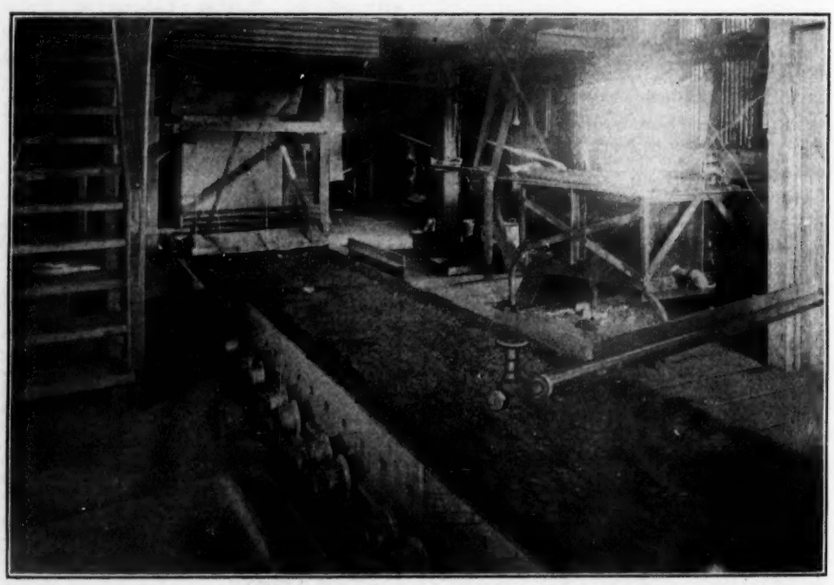


FIG. 6—PALLETS CONTAINING SINTERED MATERIAL

the fact that the porosity of the structure is carried to microscopic proportions, yet leaving sufficiently strong cell walls, may be appreciated.

The practical furnace manager may think it a long step from handling the tonnages necessary for average furnace operation and such lengthy considerations of such minute structure, but all the furnace reactions resolve themselves ultimately into microscopic proportions. Furthermore, this consideration is to show that there exists a positive distinction between the various forms of mill cinder and Dwight & Lloyd sinter. However porous the mill cinder may be, it can never approach in reductibility, the product under consideration. Mill cinder is a satisfied chemical compound, only giving up its oxygen at high temperatures, and then affording a minimum area of contact for reaction of reducing gases. Dwight & Lloyd sinter is a physical agglomeration of material treated, being bonded of particles of original size.

Several thousand tons of sinter have been produced at the Birdsboro plant and used in the blast furnace. At all times the sinter has shown itself a superior and beneficial addition to the blast furnace charge. By reason of variations in the ore mixtures, no actual figures of the fuel saving effected through the use of the sinter are available; but several times as much as 10 per cent of easily reducible lake ores has been replaced by sinter; and the management unhesitatingly declares that taking off the ore and putting on the sinter has the same influence on the fuel consumption as would result from taking off entirely that amount of ore burden.

At no time has there been any reaction in the furnace resembling that produced by mill cinder. When mill cinder is used with a burden of a high percentage of magnetic ores, a scouring action is often noted, especially when the mill cinder is put on to the amount of 12 per cent mass in one. There has never been at the Birdsboro furnace any scour action or descent of unreduced oxides since this sinter began to be used. According to all practiced indications and theoretical considerations, there seems no doubt that a complete burden of Dwight & Lloyd sinter might be used advantageously.

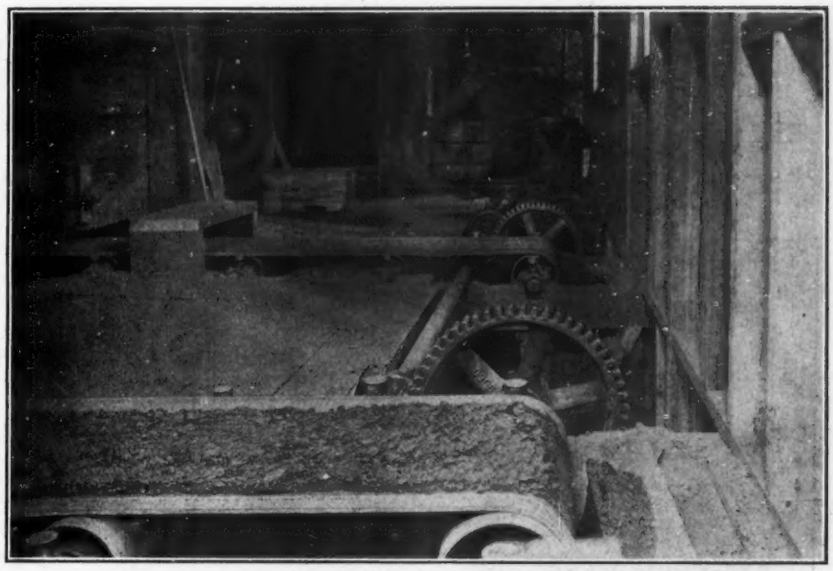


FIG. 8—BELTS FOR FEEDING THE ORE TO THE MIXER

The iron blast furnace stands on a high plane as regards metallurgical efficiency, but there are yet vast opportunities for improvement. Not the least of these lies in the due preparation of ores and fluxes prior to charging.

James Gayley, in his paper before the American Institute of Mining Engineers in June, 1911, quoted from Schin's book on "The Action of the Blast Furnace" (1871) the following sentence:

> A chemical reaction can only take place between two bodies, however great their affinity, if they are in intimate contact with each other; and the rapidity of this action will be so much greater the more numerous the points of contact are.

Mr. Gayley's purpose in this quotation was to lay stress upon the advantage of the Dwight & Lloyd sinter over other materials in giving a greater area of contact to the gases in the reducing zone. But the importance of this law is equal if not greater in its application to the reactions between solids in the fusion zone. And this is where blast furnace practice seems farthest from the ideal at present. Materials are charged in groups of tons, which can only perform their proper functions by combinations between minute particles. It then seems only logical to say that, if greater intimacy of arrangement were provided between the bodies forming slag, a distinct advantage would be gained, in that a slag of the desired chemical composition would be continuously formed in the zone of fusion. In present practice, there is an intermittent production—first of a basic, and then of an acid slag—all finding their way into the hearth, and making up a final fair average, but certainly not constituting, in the strict sense of the term, a continuous chemical operation.

The natural consequence of submitting to zones of varying temperature, mixtures of varying melting

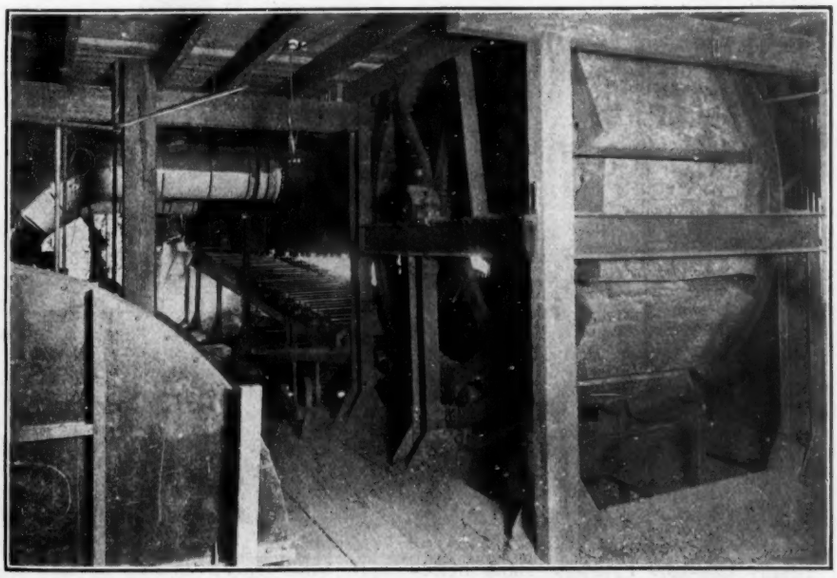


FIG. 7—VIEW OF SINTERING MACHINE, SHOWING RETURN TRAIN OF EMPTY PALLETS, WIND BOX, BLAST PIPING AND A PORTION OF THE FAN

points, is a discontinuous and disproportionately wide zone of fusion. This source of irregularity is probably the source of many slips, scaffolds and other disturbances in furnace practice.

As a possible remedy for these conditions, I would suggest a wider ap-

FIG. 1—SPEED DIAL FOR MACHINE TOOLS.

plication of the Dwight & Lloyd sintering process. Let us assume, as a hypothetical case, a mixture containing all fine ores of any specific burden, say 40 per cent of the entire ore charge, and the flux for the entire burden crushed to pass 10-mesh and under, to which the proper amount of carbon is added and sinter is produced. This sinter now contains: (1) The iron partly metallic and partly as either oxide; (2) the gangue and flux, not necessarily combined, but intimately associated and free from all CO_2. While the lime is thoroughly calcined, it differs radically from a separately calcined lime, in that it is so agglomerated with other materials as to remain solid, instead of shaking and disintegrating.

The advantages to be expected from the use of such material in the blast furnace are:

1.—The solid mixture, containing uniform slag constituents, will carry them unseparated to the bosh, where their function will be performed continuously, instead of interruptedly by *running ahead* and segregating.

2.—All the CO_2 having been eliminated, the solution of carbon by ascending CO will be avoided.

Hence, from there actions, $CaCO_3 = CaO + CO_2$; $CO_2 + C = 2CO$; there will be effected a saving of carbon equivalent to 12 per cent of the weight of the stone, assuming conditions of 1,150 pounds of limestone per ton of pig; 96 per cent of $CaCO_3$ in limestone; 85 per cent available carbon in coke, then:

1,150 pounds of limestone = 1,150 + 96 = 1,104 pounds $CaCO_3$.

1,104 + 0.12 = 132 pounds of carbon saved.

132 ÷ 0.85 = 154 pounds of coke per ton pig saved.

3.—An increased reductibility of the iron so treated. This has been conservatively estimated at 5 per cent better than the best available ore.

4.—As a larger portion of the slag forming constituents will have already been combined, an amount of carbon representing the difference between the heat for fusion and the heat of formation will be saved.

5.—Uniform delivery of properly proportioned materials to the different zones.

There has been set a numerical value for only the first case, as it is almost universally conceded that the carbon solution factor is equal to the theoretical. Upon presenting this proposition to a well versed student of blast furnace conditions he stated, "the furnace which does that will double its output." The writer does not claim such sanguine advantages as this, but feels that an advantage would be gained far in excess of the expense of sintering the materials.

Materials otherwise regarded as unfit for the blast furnace may be readily and cheaply converted into a product most desirable for that purpose. For instance, as considerable flue dust carries an amount of carbon in excess of that required for sintering its own iron-bearing constituents, this may be used by mixing the flue dust with blue billy or magnetites, thus giving a product of uniform, cellular composition without cost for fuel.

The Dwight & Lloyd sintering process thus offers to the problem of the conservation of our mineral resources a solution applicable to present economical and industrial conditions.

At the annual meeting of the J. W. Paxson Co., Philadelphia, officers were elected as follows: H. M. Bougher, president and general manager; Howard Evans, vice president; S. C. Bougher, treasurer and purchasing agent; Sherman Bougher, secretary; F. B. Platt, assistant secretary and treasurer; J. S. Hibbs, assistant general manager; James L. Crawford, marine superintendent, and A. G. Warren, mechanical engineer of plants.

The Pittsburgh office of the Independent Pneumatic Tool Co., Chicago, was removed March 1 from 1426 to rooms 1208-1209 Farmers' Bank building, Pittsburgh.

Reliance Speed Dial

With the advent of high speed steels and the continual trend toward scientific management and efficiency methods in all machine tool operations, it is exceedingly important to have some accurate method by which the machine tool operator can easily adjust his driving mechanism to obtain the prescribed speeds at the cutting tool under changing conditions of work.

Where the speed changes are accomplished by cone pulleys or gears, the spindle has a certain number of known, definite revolutions per minute, usually indicated on a plate on the machine, and it is a comparatively easy matter to embody in the blue print for the work specific instructions showing the step of the cone pulley or gear combination at which each operation can be performed to give maximum efficiency. With individual, adjustable speed motor drive, however, the speed combinations are much greater in number and are not so easily calculated.

The adjustable speed motor of the armature shifting type, built by the Reliance Electric & Engineering Co., Cleveland, permits of an infinite number of speed changes. As the arma-

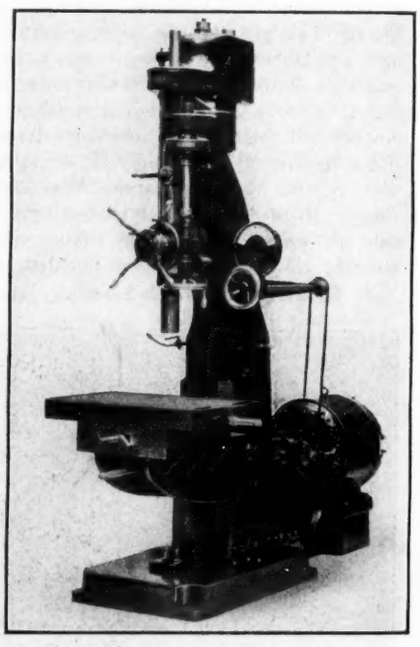


FIG. 2—FOOTE-BURT DRILL EQUIPPED WITH SPEED DIAL

ture is shifted, there are no stops or jumps but a smooth, gradual change in speed. On a machine tool driven by this type of motor, it becomes necessary to make the approximations in speed setting required with other speed change devices and it is always possible to obtain the

exact cutting speed desired, provided the operator has some means of accurately adjusting the speed of the motor to that required. A device for this purpose has been developed by the Reliance company, as illustrated in Fig. 1. This dial can be mounted at any convenient point on the machine tool, it being merely necessary that it be provided with a positive connection with the means employed for shifting the armature of the motor. When the armature of the motor is shifted and the gradual change in speed is obtained, a pointer moves in the speed dial. The scales in the dial take into account the different gear ratios between the motor and the work and can be set for different cutting speeds at the cutting tool, depending on the cutting speed used and the character of the work. The device is, therefore, an automatic calculator by which the operator can instantly set the speed of the motor so as to obtain any desired speed at the cutting tool, taking into account all of the variable factors which would affect the problem. The operator sets the dial for the cutting speed to be used and then shifts the armature of the motor until the pointer indicates the diameter of the cut to be taken on the proper scale for the gear combination used.

The dial not only serves as a guide in setting the speed accurately, but is always in plain sight as a definite indication to the foreman or inspector of the speeds in use by the operator. These dials are furnished properly calibrated for use with Reliance adjustable speed motors on shapers, drills, lathes, milling machines, boring mills or any type of adjustable speed tool.

A dial arranged for a crank shaper with one back gear is illustrated in Fig. 1. The upper scale indicating the cutting speeds is stationary. The small indicator pointing at 40 is mounted on a revolving disc with two lower scales. The lower scales showing the length of the stroke are adjusted by a knurl on front of the dial until the indicator points to the cutting speed desired. The scales are not shifted unless new cutting speed is to be used. With scales set for any cutting speed the motor armature is shifted by turning the hand wheel, as illustrated in Fig. 2, until the pointer of the dial, which is geared to the hand wheel rod, is opposite the stroke to be used. The dial illustrated in Fig. 1 is set for 40 feet a minute with the motor speed adjusted for 20-inch stroke with the back gear in. The bottom scale shows the stroke with the back gear out. In Fig. 2 is shown a Foote-Burt drill driven by a Reliance adjustable speed motor and equipped with a speed dial.

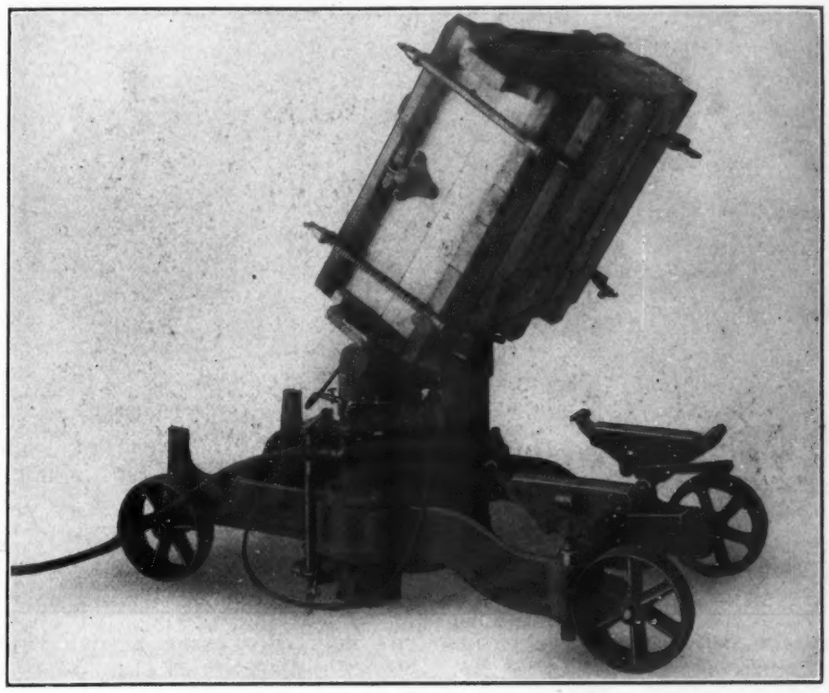


FIG. 2— TURNING OVER THE MOLD

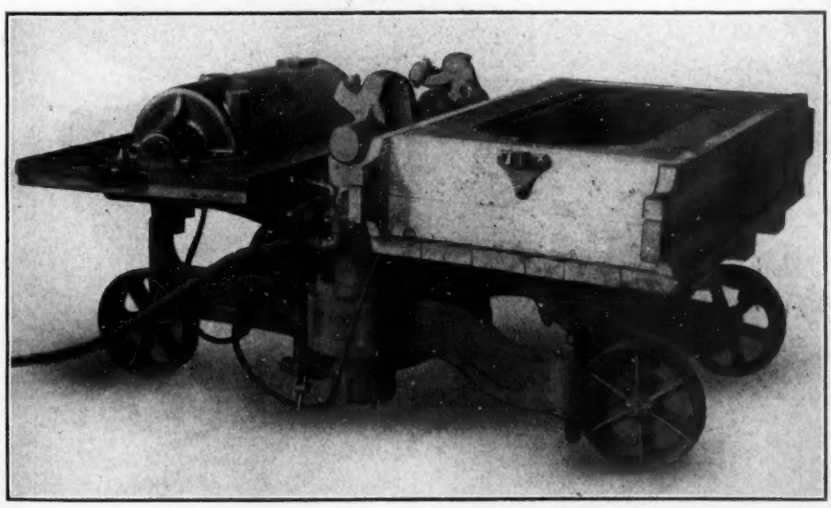


FIG. 1—POWER TURN-OVER, POWER DRAFT MOLDING MACHINE, ON WHICH THE PATTERN FOR AN AUTOMOBILE OIL PAN IS MOUNTED

A New Power Turn-Over, Power Draft Molding Machine

A power turn-over, power draft molding machine on which separate cylinders are employed for turning over the mold and for drawing the pattern, built by the International Molding Machine Co., 2300-2318 South Western avenue, Chicago, is shown in the accompanying illustrations. In none of the operations of the machine are the drawing and turn-over cylinders used simultaneously, and as it requires a lower air pressure to draw the pattern than is employed for turning over the mold, the use of separate cylinders, it is claimed, effects a reduction in the consumption of air as compared with machines employing the same cylinder for rolling over the mold and drawing the pattern. Two small cylinders are used for the pattern-drawing operation and one cylinder has been provided for turning over the mold. The arrangement of the drawing cylinders, one on each side of the machine, furthermore, precludes the possibility of the pattern swaying or sagging while it is being drawn from the mold.

The machine consists essentially of a heavy cast iron frame composed of two side rails connected at both ends

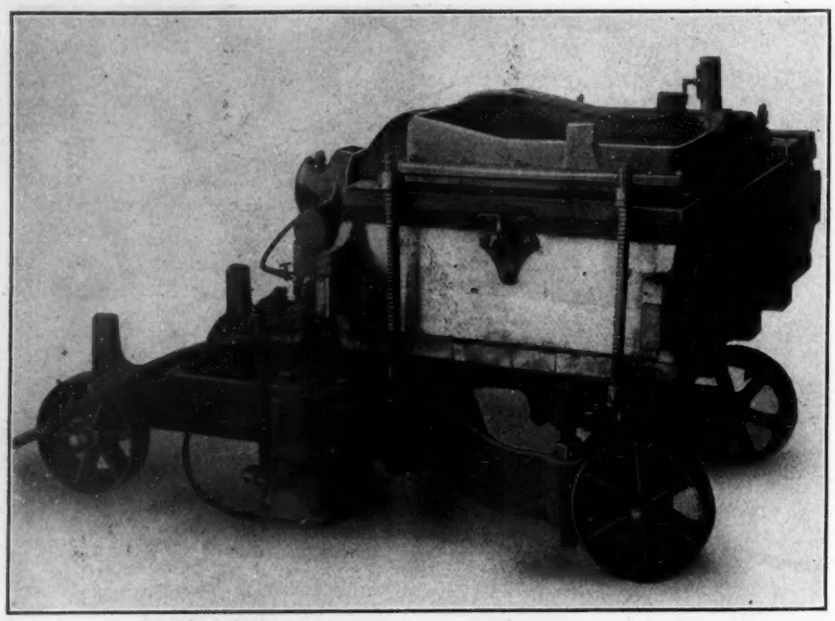


FIG. 3—THE MOLD LOWERED ONTO THE RECEIVING TABLE BEFORE THE CLAMPS HAVE BEEN REMOVED

by cross rails. These, with their adjacent parts, form at one end the ramming bed and at the opposite end, the receiving table. At the centers of the side rails are cast large, round sockets which receive the two side cylinders. These sockets are accurately machined on their upper surfaces. The annular flanges on the cylinders are machined on their lower surfaces and when the cylinders are set in place they are held in a true, perpendicular position by the two contacting machined surfaces. The turn-over pattern frame revolves on a heavy steel shaft which is driven into two cast iron hubs which form the tops of the pistons on the drawing cylinders. Integral with these hubs are two sets of heavy bearings or stops, so arranged as to engage corresponding bearings or stops on the turn-over frame. One set of stops on the turn-over frame is adjustable and is used to locate the plane of the pattern at the proper angle with relation to the drawing cylinders, so as to insure a perfect draw. The other set of bearings serves to properly limit the action of the turn-over frame when it is swung back onto the ramming bed. The turn-over cylinder is held in position by the trunnions on either side which are journaled in sockets cast into the sides of the two drawing cylinders.

The receiving table of the machine is provided with two flask receiving devices, the height of which can be adjusted to the depth of the flask used. The four points of contact act independently of each other so as to compensate for irregularities in the bottom boards. The locking lever is so located that the operator can easily reach it without being obliged to change his position. Furthermore, the locking mechanism is so designed that it is impossible for the surfaces on which the mold rests to spring out of position until different equalization is required.

In Fig. 1 the pattern of an automobile oil pan is shown mounted on the turn-over pattern frame which is in position on the ramming bed. After setting the flask in position, ramming the mold and clamping the bottom board to the pattern frame, air is admitted to the turn-over cylinder by the full movement of the lever actuating the valve on the turn-over cylinder. This air valve controls the movement of the mold to the position shown in Fig. 2, which is just past center. When the mold attains the position illustrated in Fig. 2, the air is exhausted from the turn-over cylinder and the mold is lowered onto the receiving bed, as shown in Fig. 3. After locking the two flask receiving devices, the clamps are removed and air is admitted to the pattern-drawing cylinders, the patterns being drawn from the mold, as illustrated in Fig. 4. When the limit of draw has been reached, which is controlled by the length of the turn-over cylinder piston shaft, the turn-over frame automatically begins to turn back to its original position and as it passes center, the air is exhausted and the pattern frame is lowered onto the stops of the ramming bed, as illustrated in Fig. 6, which also shows the mold ready to be removed to the floor. Fig. 5 shows the pattern frame in its movement back to its original position.

In designing this machine the International Molding Machine Co. has endeavored to provide for the convenience of the operator, for the acceleration of the speed of operation, for the varying conditions under which the machine will be used, and for molding a wide variety of patterns. Separate levers are provided for actuating the valves on the turn-over and pattern-drawing cylinders. The valves have been so designed that neither oil nor water pressure is required to facilitate the operation of the machine. All parts requiring lubrication are easily accessible and all sections subjected to

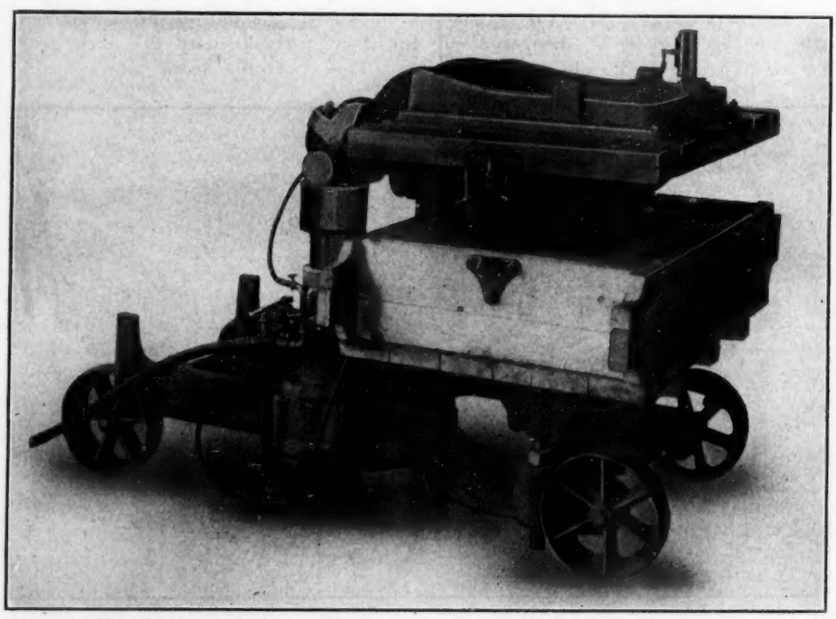


FIG. 4—THE PATTERN DRAWN FROM THE MOLD BY THE TWO AIR CYLINDERS

strain are made of steel. Machines of the same size are interchangeable, both as to different parts used in their construction and the fitting of the patterns.

These machines are built in six sizes with turn-over frames varying in width from 26 to 36 inches and with draws of from 8 to 14 inches. The machine illustrated has a 30-inch frame and an 8-inch pattern draw. The weight of the mold is 1,000 pounds.

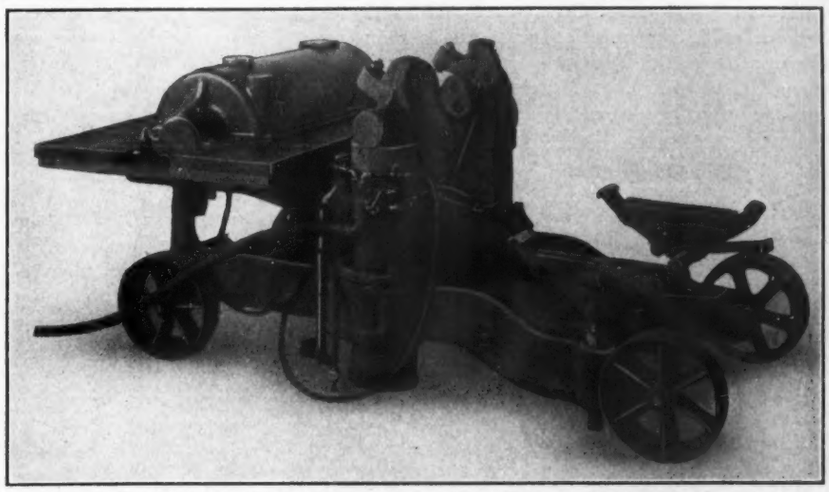


FIG. 6—THE PATTERN TURNED BACK TO RECEIVE A FLASK, THE MOLD HAVING BEEN REMOVED TO THE FLOOR

The Schumacher Briquetting Process[1]

By Joseph W. Richards

The Schumacher method of briquetting flue dust, or flue dust mixed with fine ores, or, in a few exceptional cases, coke dust, has come into large commercial use in Europe, and a small plant is already in operation in the United States. It promises to become of such great importance to the iron industry of the United States that the following description will certainly interest the majority of our pig iron producers.

Discovered in 1908, the process rests upon the observation of Dr. Schumacher that blast furnace flue dust, while possessing of itself no binding or cementing properties, acquires strong cementing properties if mixed with a very small amount of certain salt solutions, the amount of which is so small that the resulting cementation appears to be rather by catalytic action of the salts than by the mass action of such chemicals. To be more specific, fresh blast furnace flue dust mixed with from 5 to 10 per cent of its weight of magnesium chloride or calcium chloride solution, that is to say with from 0.25 to 2 per cent of its weight of magnesium chloride, or calcium chloride, acquires the property of setting within a short time, from 15 to 60 minutes, and forming a hard, cemented briquette. Alkaline solutions appear to have no action such as described, and they even interfere, if present, with the action of the magnesium and calcium solutions.

When treated in this way the flue dust briquette sets very hard, apparently from pure excess of cementing and setting power. It is, therefore, possible to mix with the flue dust a considerable proportion of inert ore or like material, which has no setting power by this process, and thus to make a compound briquette containing large quantities of ore mixed with flue dust, but in which the flue dust may be regarded as the cement or binding material. A strongly-cementing flue dust will carry as much as three times its weight of fine ore or the like, and yet produce a satisfactorily strong briquette.

The Cambria Steel Co. has installed at Johnstown, Pa., a small plant consisting of two presses, with a combined capacity of 250 tons of briquettes per day. One of the presses is of the mechanical type, with hydraulic safety regulator; the other is a Ronay hydraulic press. The first makes briquettes the size of an ordinary firebrick, the latter makes briquettes cylindrical in shape, 8 inches high and 8 inches in diameter, and uses a considerably higher pressure than the former.

Cambria's Briquetting Plant

As seen in operation early this month, the warm flue dust from the dust catchers was stored in one hopper, while fine Mahoning ore, containing from 10 to 12 per cent of moisture, and quite cold, was stored in another hopper. A rotating feeding device formed a stream of these materials, passing into the mixing trough with ordinary spiral, into which at the same time was run a 30 per cent solution of calcium chloride, the flow of which was regulated by a hand valve. The trough fed the mixture directly into the hopper of the press. The flue dust was warm, approxi-

[1]Presented at the New York meeting of the American Institute of Mining Engineers.

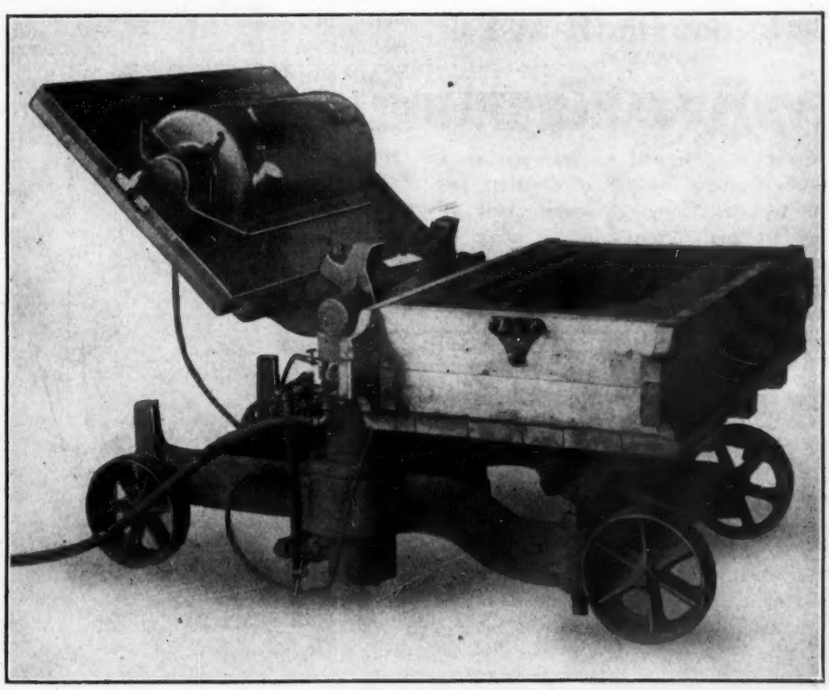


FIG. 5—TURNING BACK THE PATTERN IN POSITION FOR MAKING ANOTHER MOLD

mately at 90 degrees Cent., the ore was ice cold; the solution was cold. The mixture fed to the press was just warm to the touch, the bricks going from the press were decidedly hot and steaming, and when loaded into the car they were quite hot to the touch and steamed vigorously.

This heating of the mixture as soon as compressed into the briquette is a characteristic of the process, and is an index of the rapid chemical reaction taking place which results in the cementing of the material.

The Bruck-Kretschle press consumed 35 horsepower with an output of seven tons per hour; the Ronay press, 25 horsepower, with an output of four tons per hour.

The flue dust carries from 18 to 20 per cent of coke, which is all carried into the mixture, said mixture being 70 of ore to 30 of flue dust. There is from 5.5 to 6 per cent of coke in a finished briquette. The saving of this coke, 20 per cent in weight of flue dust used, represents sufficient value to pay for the entire cost of the briquetting of the dust. Undoubtedly the coke thus enclosed in the briquette acts on the ore in the furnaces, and reduces it with at least as great an efficiency as the *green* coke put into furnace. Therefore, if the furnace has sufficient smelting power, other things being equal, this coke of the briquette may be estimated as saving at least an equal weight of coke to the furnace.

As to physical properties, a briquette made of flue dust absorbed 11.5 per cent of its weight of water, representing 27 per cent of voids, a very satisfactory porosity. Briqettes one day old, hard-dried, tested for compressive strength, gave a minimum of 445 pounds per square inch.

Several hundred tons of these briquettes were already in the ordinary furnace bins, ready for use in the furnaces, and appeared to have stood transportation to that point and dropping 10 to 20 feet, and also subsequent action of ice and snow for several weeks without deterioration; only a few were broken, and but little dust was made.

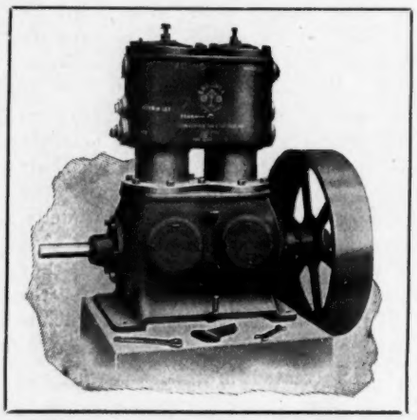
Cost of Briquettes

The operation of producing briquettes in this manner, from flue dust and fine ores, appears to have attained the maximum of simplicity, the operation consisting merely of mixing with the solution and pressing into shape. Estimates of probable cost, if the operation were carried out upon a scale such as would suit a large blast furnace plant, yielded as the outside figure 30 cents per ton, inclusive of depreciation, repairs and interest on plant.

The inventor of this process has certainly made a great advance in the art of briquetting these difficult materials at a minimum cost and with maximum simplicity of plant. It is not difficult to predict a very large application of this process in the United States, as soon as the behavior of the briquettes in the blast furnace has been proved. The very satisfactory running of similar briquettes in European blast furnaces appears to leave no doubt upon this phase of the question also.

A High Speed Air Compressor

The Gardner Governor Co., Quincy, Ill., has recently placed on the market an improved, vertical, high-speed air compressor, one style of which is shown in the accompanying illustration. It is built in several sizes



VERTICAL, HIGH SPEED AIR COMPRESSOR

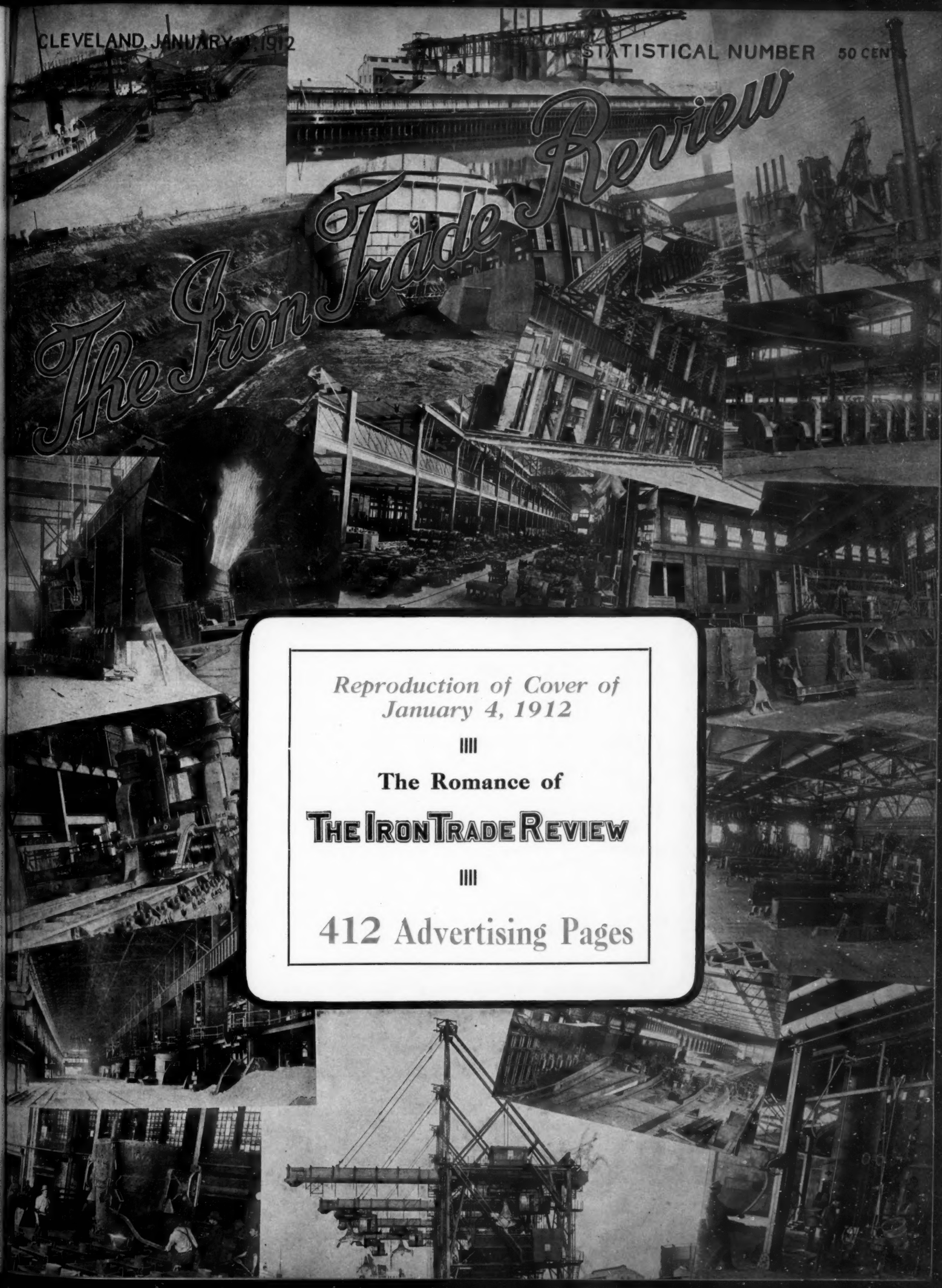
varying from 3 x 3½ inches up to 8 x 6 inches. The 6 x 6-inch compressor is designed to operate at a standard speed of 225 revolutions per minute, delivering 22 cubic feet of free air per minute, but it may be run at 400 revolutions per minute, at which speed it delivers 40 feet of air at a maximum pressure of 100 pounds per square inch. This requires about 9 horsepower. The air is admitted to the cylinder through an annular port located at the lower end of the piston travel. An inlet valve is also placed in the top of the piston which permits the air to enter on the downward stroke. The discharge valve is in the upper part of the cylinder. These valves are extremely light, being made of tempered sheet steel not over 0.02 inch in thickness. Special attention has been given to the design of the air passages and the various bearings to avoid both pneumatic and mechanical friction. The crank case is entirely enclosed, making it dirt and dust-proof, and is provided with large hand-hole plates, permitting access to the connecting rod bearings. A combination grease and oil system of lubrication is employed. The connecting rods are hollow and are filled with a hard grease lubricant which is forced through by means of compression cups. The piston is of the trunk pattern, fitted with three rings.

This machine, which is known as the Gardner-Rix compressor, is especially suited for motor drive. Its high speed permits the use of high speed motors, which are known to be more efficient than the lower speed types. Connection between the motor and the compressor may be made by ordinary spur gearing or with a silent chain. When gearing is used, a rawhide pinion is preferred for the motor shaft.

Centers of the German Iron Industry

About 60 per cent of the ore mined in Lorraine and Luxemburg, Germany, is smelted locally, and about 14 per cent is shipped to Westphalia and 13 per cent to the Saar district. About one-sixth of the ore in German Lorraine and most of the Siegerland mines are owned by Westphalian iron masters, while nearly 15,000 acres of ore lands in French Lorraine are also held by German interests. In 1875 there were 297 blast furnaces in the German empire, of which 21 were in Luxemburg. At the end of 1908 there were 304 blast furnaces. The great difficulty with which German iron masters have to contend is the distance which separates the Lorraine-Luxemburg ores from the coke of Westphalia. The ore must either be brought to the coke or the coke to the ore, but the heavy cost of transportation is partly compensated for by the cheapness of the ore and its self-fluxing character.

The offices and plant of the Brown Specialty Machinery Co., Chicago, manufacturer of core machines and core-making equipment, are now located at 2440 West Twenty-second street. The factory occupies double the floor space of the former plant and the offices are combined with those of the Brown Mfg. Co. in the Brown Bros. building. Elmer A. Rich Jr., general manager of the Brown Specialty Machinery Co., has been elected president and general manager of the Brown Bros. Mfg. Co.



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The Romance of

THE IRON TRADE REVIEW

IIII

412 Advertising Pages

A Business Is Judged

THE ROMANCE OF THE IRON TRADE REVIEW

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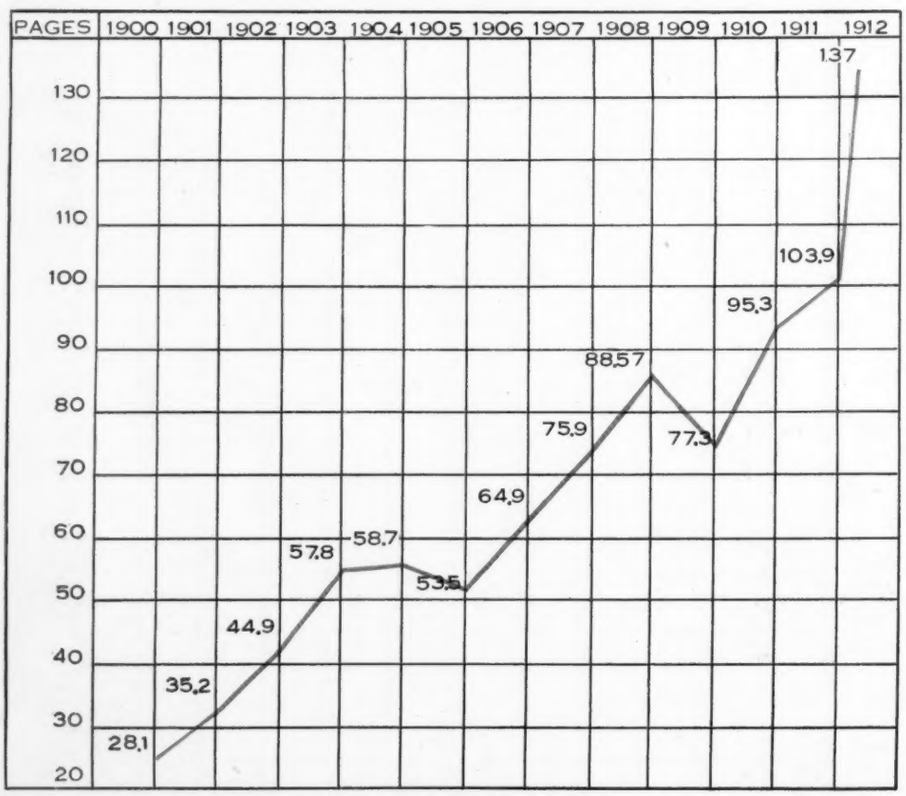
Advertising patronage is the ultimate test which reflects the rise and fall—in CIRCULATION and EDITORIAL MERIT—of every publication.

As compared with 1900 the advertising patronage of THE IRON TRADE REVIEW today shows

A GROWTH OF 488 PERCENT



***THE IRON TRADE REVIEW'S** unparalleled increase in advertising patronage—from a small beginning in 1900 to its present commanding position among the trade and technical publications of the world—is graphically shown in the above chart.*

By Its Consistent Growth

NOT FICTION BUT FACTS

Advertising Patronage the Ultimate Test

Advertising Patronage is based upon quality and quantity of circulation—

Quality and quantity of circulation are based upon editorial merit.

Editorial merit has made THE IRON TRADE REVIEW the world's standard iron and steel publication.

Editorial merit has made THE IRON TRADE REVIEW the most widely quoted trade paper in the world today.

Editorial merit is reflected in its market reports which are without bias to either buyer or seller.

Editorial merit has made THE IRON TRADE REVIEW a tremendous institution and a tremendous factor in the iron and steel business of the world.

Editorial merit alone is the reason why contracts involving millions of dollars every year are based solely upon the quotations of THE IRON TRADE REVIEW.

Editorial merit is the slogan of the 47 editors and correspondents engaged in the production of the world's greatest Iron and Steel publication—and a

Fearless and unprejudiced editorial policy has resulted in an increase in quality and quantity of circulation since 1900; corresponding to that of the advertising patronage of THE IRON TRADE REVIEW which shows

A GROWTH OF 488 PERCENT

Advertising Pages in THE IRON TRADE REVIEW 1900 to 1912

Average number of advertising pages in THE IRON TRADE REVIEW per issue for each month from 1900 to 1912

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
JAN.	24.8	33.5	39	46.2	60	55	59	70.9	92.6	108.2	136.2	148.1	170.1
FEB.	25.7	33.2	42.5	55.5	59.5	52	58.5	74.8	81.2	73	89.5	97.2	104
MAR.	27.8	33.5	32.5	60	57.4	48.6	60.8	75.8	77.7	75	85.9	96.8	
APR.	28	31.7	44.5	55.4	61	46.5	63.5	77	75.7	72.4	84.5	100.6	
MAY	27.6	31.8	43.8	62.5	58.5	52.2	60.2	73.8	78	75.5	91.4	102.2	
JUNE	30.2	31.9	45	63.5	57.8	51.2	65.5	78	79	76.5	89.5	100.3	
JULY	28.3	34.5	44	31.3	57	51.5	64.5	78.5	75.3	70.8	92.6	102.5	
AUG.	28.4	33.8	45	64	55.5	51.6	64.2	78.2	77	70.5	93.5	98.8	
SEPT.	28.2	33.5	47	64.5	53	57	67	81.5	77.5	70.8	90.6	103.8	
OCT.	28.2	33.4	49	62.6	69.5	59	70.5	70	75.6	76	98	104.5	
NOV.	28.6	57	51	66	54.7	57.2	70.3	73.3	76.5	78.5	96.5	87.8	
DEC.	31.5	34.5	55	61.8	53	60	75	78.3	76.8	80.4	95.8	104	

Average Number of Advertising Pages per issue for each year from 1900 to 1912

1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
28.1	35.2	44.9	57.8	58.7	53.5	64.9	75.9	78.57	77.3	95.3	103.9	137

The above table contains facts—not fiction, and figures which record a growth of advertising patronage never before obtained in the history of trade and technical journalism.

THE IRON TRADE REVIEW

VOLUME XXXIII. CLEVELAND, O. JANUARY 4, 1900. CHICAGO, ILL. NUMBER 1

As it Was

January 4, 1900

24 Advertising Pages

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Send for illustrated catalogue.

Cahall Sales Department, Pittsburg, Pa.

THE "PIQUA" ROOFINGS.

IRON OR STEEL, SIDING AND CEILING, ARE ROLLED FROM THE BEST MATERIALS AT OUR OWN MILLS, AND EVERY SHEET IS THOROUGHLY EXAMINED BEFORE PAINTING.

They are not high-priced, neither are they made up cheap at the expense of quality.

The Cincinnati Corrugating Co.,

Box 543 PIQUA, OHIO.

HONEST BABBITT METALS.

We do not claim that we are supplying ten different governments with Babbitt Metal. **Our Metals** are used by more than three thousand leading Consumers in UNCLE SAM'S own country. They are invariably uniform, reliable, contain only pure and best material, remarkably fluid, and free from "drossing."

PRICES TO ALL.—XXX Nickel Babbitt 24 cts. per lb.; No. 2 Grade (for general shop use), 10 cts. per lb.; F. O. B. your depot, on your customary terms. Any special mixture of metal made to order. 3,000 References.

SWARTS METAL REFINING CO., Office and Works, 20 N. Desplaines St., **Chicago, Ill.**

ENTERPRISE BOILER COMPANY YOUNGSTOWN, O.

Draught Stacks, Blast Furnaces and Heavy Plate Work a Specialty. Write for Estimates.

POWER TRANSMISSION

W. A. JONES FOUNDRY & MACHINE CO.

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THE UNION BOILER TUBE CLEANER CO.

231 Penn Ave., PITTSBURGH, PA.

Has set the acknowledged standard for the world for removing—by power driven mechanical devices—all conditions of scale from all makes of Water Tube Boilers including the Climax and Stirling types, the Hazelton boiler, and also from pipes and tubes used in industrial enterprises. We have the only **Flexible Shaft of Remarkable Strength and Phenomenal Durability under Great Stress.**

..Fire Brick..

Ground Clay A SPECIALTY. Special Shapes.

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BLAST FURNACE, ROLLING MILL, MALLEABLE IRON AND LIME KILN BRICK.

BEST ON EARTH

Blakeslee Steam Jet Pump.

REASONS FOR ITS USE:

1. Simplicity. 2. Is independent of engine. 3. Will pump sandy or impure water. 4. Have no valves and no wear. 5. Not subject to freezing. 6. Economy and reliability. 7. All parts interchangeable. Write

BLAKESLEE MFG. CO., Du Quoin, Ill.

TURNBUCKLES.

Cleveland City Forge & Iron Co.,

CLEVELAND, O.

Chicago Drop Forge & Foundry Co.

Works established 1880.

DROP FORGINGS

of All Kinds.

KENSINGTON, ILL.

38 minutes South of Chicago by Ills. Central R. R. Suburban trains.

W. S. ROCKWELL & CO.,

OIL FURNACES.

26 Cortlandt St. New York City.

It pays to advertise in THE IRON TRADE REVIEW. See advt on page 22.

PIG IRON & COKE.

ROGERS, BROWN & CO., Cincinnati, O.

Tin Mills F. R. Phillips' Sons Co. See page 42.

GLOVER LEAF BRAND GALVANIZED SHEETS. See Page 30. STRUTHERS IRON & STEEL CO., Struthers, Ohio.

THE UPSON NUT CO., Cleveland, O.

MANUFACTURERS OF

MACHINE AND CARRIAGE BOLTS, HOT FORGED AND COLD PUNCHED NUTS, LAG SCREWS, BOLT ENDS, WASHERS, ETC. Catalogue and Prices on Application.

H. C. FRICK COKE CO.

Post Office, PITTSBURG, PA.,

Mines and Ovens in the Connellsville Coke Region, Pa.

Producers of CONNELLSVILLE COKE ONLY

For Blast Furnace and Foundry Cupola Work; also Crushed Connellsville Coke (substitute for Anthracite Coal) for manufacturing and domestic purposes. 18,500 Ovens. Daily capacity, 30,000 tons of Coke. Direct connections with all railroads entering the region.

Quotations, Freight Rates, Pamphlets giving full information, promptly furnished on application.

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SCREWS

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Lathe and Planer Tools.

50 styles and sizes. For Turning, Planing, Boring, Cutting Off, Threading, Drilling and Reaming. Saves time and tool steel. Thats money. We are getting out a lot of new tools.

Send for Latest Catalog.

ARMSTRONG BROS. TOOL CO., Chicago, Ill. U. S. A.

There's neither magic nor any occasion for magic in galvanized iron—Apollo is workable—magic enough.

Apollo Iron and Steel Company, Pittsburgh.

The Bourne-Fuller Co..

DISTRIBUTORS OF

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Bristol's Patent Steel Belt LACING

Most Perfect fastening for all kinds of Belting. Samples Free.

READY TO APPLY FINISHED JOINT

THE BRISTOL CO., Waterbury, Conn.

RECORDING PYROMETERS to 1400 degrees.

EDWARD BROWN,

313 Walnut St., PHILADELPHIA.

Established 1860.

The Sintering and Briquetting of Flue Dust[1]

A Discussion of the Various Processes Employed, Principles of Operation and Economies Effected

By Felix A Vogel

Flue dust, to most blast furnace operators, means a troublesome by-product, the formation of which should be curtailed, if not eliminated entirely. However, with the increasing use of fine ores, larger furnaces and high pressure blast, the production of flue dust is constantly increasing, and amounts annually in the United States to from 3,000,000 to 3,500,000 tons, an exceedingly high tonnage, of which a large part has been discarded as valueless.

As a result of greater economy in the iron industry, attention of our furnacemen has been directed towards the utilization of this enormous amount of waste material, a fact which had also been given due consideration by metallurgists abroad.

Flue dust is generally a fine material containing considerable coke and iron ore, with a small admixture of lime and silica, depending upon the burden. The iron ore is partly reduced, which shows that it originates largely from the reducing zone of the blast furnace.

Flue Dust Treatment

In the United States this dust usually contains 20 per cent of coke and more than 40 per cent of iron. Estimating coke to be worth $3.25 per ton, and iron ore 7 cents per unit, the flue dust, unless made available, represents a loss to the furnaceman of $3.50 per ton. This accounts for the first efforts to re-charge the flue dust into the furnace, either by moistening it down with an excess of water, or mixing it with clay to form balls or pulp, or treating it with limewater.

These methods, however, have been practically discarded, as they failed to produce the desired economies To recover, in the blast furnace, all the values represented by the material contained in the flue dust, the following conditions should be complied with:

1. The dust should be agglomerated into lumps about the size of furnace coke, so that it will help to carry the burden and facilitate the flow of the gases.
2. The agglomerated material should be strong enough to carry the burden without disintegrating; it should be heavy so as to decrease its volume, and it should be sufficiently porous to permit the furnace gases to penetrate fully. Under no condition should the surface be glazed.
3. It should contain all of the valuable constituents of the dust, such as coke, iron ore, lime, etc.
4. It must stand handling without undue breakage, and should not produce more than 5 per cent of dust.
5. It must stand the weather.
6. It must not disintegrate in the blast furnace before being greatly or totally reduced.
7. It must submit to easy reduction without requiring additional fuel.
8. It must not contain substances detrimental to blast furnace operations.
9. Its cost of production must be low.

Advantages of Agglomerated Material

Blast furnace operations, by the use of such agglomerated material, will result in

1. Regular, steady operation.
2. Increased burden, increase in the yield and metal produced.
3. Decrease in the consumption of coke.
4. Decrease in the production of flue dust.
5. Decrease in the cost of producing pig iron.

In order to obtain these results American and European metallurgists have followed two different lines. In the United States it has sufficed to save the iron content only, though not in the best possible form, while abroad the endeavor has been to make a high class product which would meet all the conditions above enumerated.

A number of processes have been evolved in the United States, generally known as agglomerating and sintering processes. They are based on fritting together the particles of ore by heat, the binding action being due to the formation of silicates, mostly of iron. When the coke has not been eliminated mechanically from the dust, it is burned out, leaving ashes in the agglomerated material, which increases the formation of silicates of iron or glazing material. In some cases, however, more fuel is added to the flue dust, which, naturally, further increases this drawback.

The nodulizing process, the oldest process in the United States, has been in successful operation for a number of years. Flue dust is treated either directly, or it is previously submitted to a magnetic separation to eliminate coke and lime. This is done to facilitate the subsequent nodulizing operation, which is carried on in a slowly rotating cement kiln from 80 to 120 feet long. From 200 to 300 pounds of finely-powdered coal is used per ton of finished material, the coal being blown into the kiln. Gas and oil have also been tried with more or less success. The heat produced is considerable and difficult to control, the semi-soft material formed consisting of iron ore particles and slag, which by the revolving action of the kiln, is balled together in nodules of various sizes—from a pinhead to that of a cannon ball—which are usually quite dense, often fused and glazed. They contain from 60 to 67 per cent of iron, which makes them quite attractive from the furnaceman's point of view. To make nodules an elaborate and expensive plant is required, the operation of which is more or less difficult and costly.

The Pot Process

The Huntington-Heberlin pot process, which has been used with good results in the roasting of pyrite cinders, has been recommended for the fritting of flue dust. The resulting fritted material is of more or less cellular structure. However, this would not be an advantage, as the surface would be largely glazed, rendering it not permeable to gases, and would have to be removed in the blast furnace at about smelting heat.

The process is somewhat simple, requiring stationary iron pots fitted with a perforated false bottom through which the air is blown into the charge. The equipment is cheap; the operation, however, is not continuous, which makes it expensive.

The Groendal briquetting process has also been applied to flue dust The flue dust, either moistened, or after the elimination of the coke and stone, is pressed into bricks which are subsequently fritted in high temperature. To facilitate the operation it was found necessary to eliminate

[1]Presented at the New York meeting of the American Institute of Mining Engineers.

the coke; this, however, increases the cost. The separated coke is of little value, since it contains many impurities. The machines used are ordinary brick presses. The bricks are carefully placed in layers on cars, which are run into long kilns about 170 feet long, where they are submitted to high heat, gas being used for the purpose. The platforms of the cars are built of firebrick and form the bottom of the kiln. The highest temperature, about 1,300 or 1,400 degrees Cent., is reached in the center of the kiln, the highly-burned briquettes working gradually towards the cooler end of the kiln, where they are finally unloaded. The operation lasts about seven hours. The resultant briquettes contain from 65 to 70 per cent of iron with practically no impurities, these having been eliminated. No ashes are left by the fuel. The briquettes are only slightly fritted, are very porous and friable, and make a high class material for use in an open-hearth furnace. The manufacture of Groendal briquettes is expensive, necessitating a costly plant, which has limited output. A ton of flue dust will produce about two-thirds of its weight in briquettes.

Dwight-Lloyd Process

Quite recently the Dwight-Lloyd process has been applied to the sintering of flue dust. The material is submitted to internal combustion in layers of from 5 to 7 inches thick. It is fed on an endless conveyor formed of iron pallets or grates. After the fuel therein contained has been ignited by means of a gasoline torch, or some other device, the air is drawn through by suction. The operation lasts about 20 minutes.

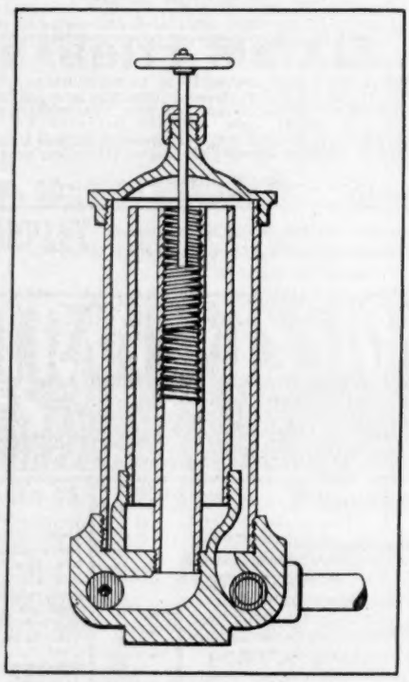
A good deal has been published of late in regard to this process. It is claimed that the required plant is not costly, while the operating expenses are considerably lower than in the previous process. The resultant sintered material is not homogeneous and, while a large portion of it is of cellular structure, it is glazed on the surface, which makes it quite difficult to reduce in the blast furnace.

The Greenawalt process uses much the same apparatus as the Heberlin pot, but air is drawn through the charge similar to the Dwight-Lloyd process.

The sintered material from these various processes is expensive on account of the loss of carbon and, with the exception of the Groendal briquette, is not of good physical structure and is usually glazed on the surface. The briquetting of flue dust has been more attractive abroad than has the sintering.

The lime process mixes the flue dust with from 5 to 10 per cent of hydrate of lime and, after briquetting the material, is exposed to the air for a certain length of time, so that a carbonate is formed which is the binding medium. This binder will eventually act as flux and will replace a certain amount of stone. The process, while having decided advantages, is quite cumbersome and costly, as the briquettes must dry from two to four weeks under cover.

The pioneer process uses sulphide pitch, obtained from the sulphide pulp mills, as a binder. It is an organic substance, rich in carbon and hydrocarbons, which will burn readily and thus increase the calorie value of the material. The flue dust is pressed into briquettes with from 4 to 8 per cent of sulphide pitch; they are quite hard and give fair results, but the process is expensive.



THE WARLIC WATER HEATER

The Ronay process does not use a binder. The flue dust is submitted to a very high pressure in a specially-constructed type of hydraulic press; the resulting briquettes can be handled immediately and have proved very satisfactory. The process requires an expensive plant, however, increasing the operating cost.

The Schumacher process does not use what may properly be called a binder, but is based on the latent cementing actions existing in fresh flue dust and which are made active by the presence of a small amount of a catalytic substance. Thus 0.25 per cent of magnesium chloride mixed with fresh flue dust and from 6 to 10 per cent of water, pressed into briquettes, will create a strong reaction, noticeable by the considerable heat developed; the briquettes will be perfectly set and hard within a few hours. The process is very simple, an ordinary pug mill being used in which to mix the material, which is subsequently pressed into briquettes in a toggle press and then loaded on cars to allow them to set.

Some flue dust will react so strongly that a large amount of ore or coke breeze may be added to the briquettes: in these cases the flue dust acts as a binder.

The Schumacher process requires an inexpensive plant and the cost of manufacturing is low. It is extensively used abroad and has replaced some of the other methods. The briquettes of all-agglomerated materials have given most satisfactory results abroad and highest returns and values to the blast furnace operators.

The Warlic Heater

The Warlic Heater Mfg. Co., 405 Lucas avenue, St. Louis, has recently perfected a device for heating large quantities of water to uniform temperature by steam. The construction of this apparatus is shown in the accompanying illustration. It is designed for installation in manufacturing plants where considerable hot water of uniform temperature is required and is especially adapted for shower baths and for heating water at concrete mixing plants.

The device consists of a series of three concentric tubes. The inner tube is perforated and is fitted with a threaded plug, as shown in the illustration. Steam is admitted to this tube, escaping through the perforations which are uncovered by the plug. The water enters through the outer annular space and overflows in a thin stream into the middle passage, where it is met by and mixed with the steam. The device is said to be effective because the steam and water are divided into such small quantities that an intimate mixture is assured. It may be used wherever the steam pressure exceeds 10 pounds per square inch.

The town of Parry Sound, Ont., has adopted a by-law granting a bonus of $25,000 and a loan of $25,000, to the Standard Chemical, Iron & Lumber Co., for the establishment of charcoal iron blast furnaces.

New Line of Board Drop Hammers

A new line of board drop hammers, in which are embodied many novel features of construction, built by the Chambersburg Engineering Co., Chambersburg, Pa., are shown in the accompanying illustrations. The hammer is so designed that it is not necessary to dismantle it to replace the adjusting bolt and the method of adjusting the hammer for lining-up dies is likewise a valuable feature. The front rod is lifted into place by the gradual and direct pick-up of a segment rolling in the rack. This eliminates the usual severe shock and strain on the front rod and prevents the breakage of these rods due to crystallization. The knock-off construction is another valuable feature, as the incline on the ram is so gradual that practically no shock is imparted. The design of these hammers also permits of the use of any height of dies.

The head is mounted on top of the frame and is securely held in place by four through-bolts passing through drilled holes which have spiral springs to absorb shock. The rolls, either plain or geared, as desired, with their driving spindles, are located in hooded eccentrics, the front eccentric being provided for operating and the rear eccentric for adjustment only. These eccentrics are steel castings made in one piece. The spindle bearings are exceptionally large and are well provided with oil reservoirs. The board clamps are located at the extreme top on duplicate eccentrics and in this way do not come in contact with the oil. When the ram is suspended the board is gripped in such a way that it hangs free of both rolls. The board clamps are so positive in action that even the heaviest rams are instantly gripped in any position. When the treadle is fully depressed the board falls free. Adjustments to the back roll and board clamp to take up the wear of the board, are made from the floor by means of adjusting bars at the back of the machine within easy reach of the operator, as shown in Fig. 3. The adjustment is provided for ⅜ to 7-16 inch wear of board. The frames are about 2 feet shorter than the general standard, although the fall of the ram is greater than the average.

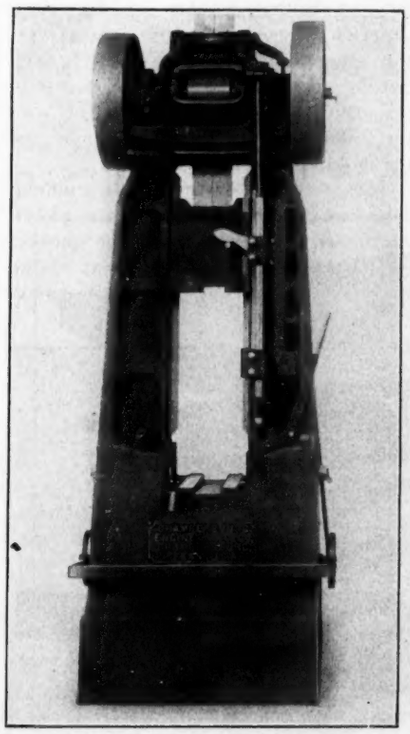


FIG. 1—FRONT VIEW OF BOARD DROP HAMMER

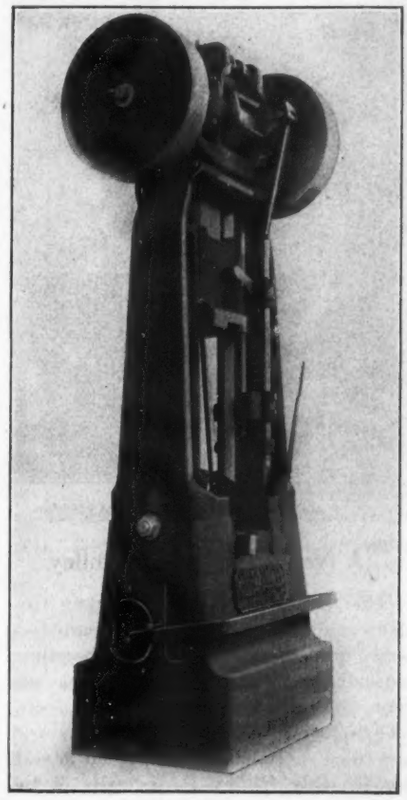


FIG. 2—BOARD DROP HAMMER, SHOWING RACK AND SEGMENT LEVER

The frames are made of air furnace iron and are of reinforced I-beam section to withstand the varying strains imposed upon them in breakdown work. The frames are of uniform section throughout and are deeply pocketed in the anvil with a bearing on their outside edges for the entire length of tongue. They also bear on the entire bottom surface, thus insuring the perfect and permanent alignment of the frames and ram. The tops of the frame are machined to jigs, tongued and are fitted to the lifter head. The frames are spaced and held in line with the lifting rolls by steel tie bolts with distance pieces. The greatest weight in the frames is at the base, where the blow of the ram is to be taken when the dies meet. The bearing surface of the V's has been made especially large so as to provide ample strength and wearing surface.

The adjustment of the frames to align the top and bottom dies is made by large tension bolts and the construction is such that in case of fracture they can be passed out into the die space and quickly replaced without disturbing other parts of the hammer. These bolts are supported their entire length in a bored opening.

The ram or hammer is made of open-hearth steel and is perfectly balanced, being sufficiently deep from front to back to insure the alignment of the dies. The lifting boards are made of well seasoned maple and are secured by an undercut plate with teeth on one side to permit of the use of a straight board and to prevent the board from pulling out. These boards can be put in place while the pulleys are in operation.

The anvil is made of air furnace iron in one piece, and the cap consists of open-hearth steel. The hammer can be furnished with anvils

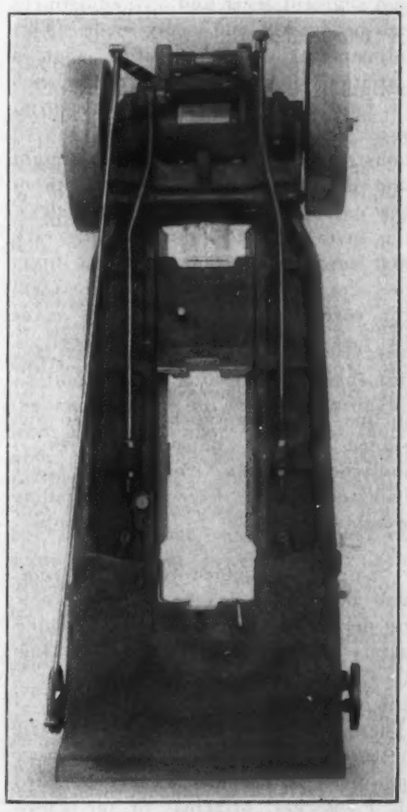


FIG. 3—BACK VIEW OF BOARD DROP HAMMER

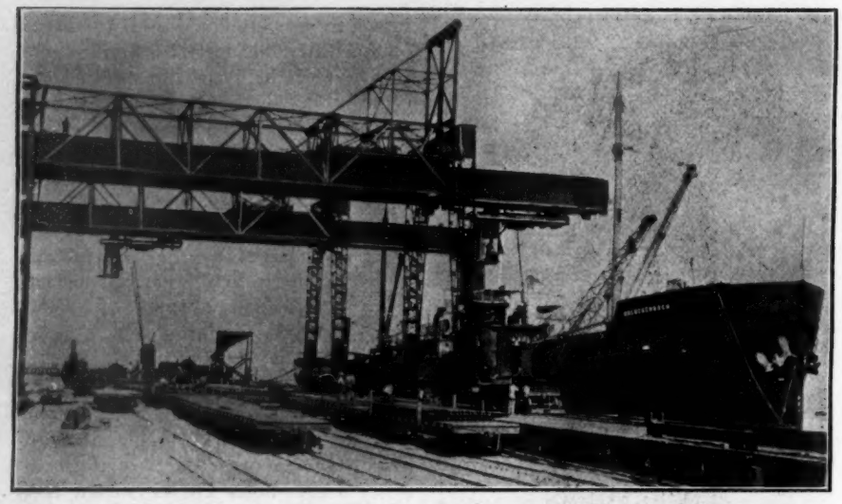


FIG. 1.—TROLLEYS TRANSFERRING RAILS FROM CARS TO STEAMSHIP

weighing either 15 or 20 times the rated falling weight of the ram and can also be furnished of steel if desired. The anvil is secured to the frames by four through-bolts provided with spiral springs to reduce shock. All the bolts are set at an angle and the pockets for the bolt heads to the compression side of the anvil are eliminated, thereby removing the possibility of breakage at the bolt holes.

The stroke is adjusted by a rack and segment lever and any adjustment can be quickly and easily made. This adjustment is so sensitive that a variation of any fraction of an inch or foot may be obtained. The front rod, owing to the eccentric type of construction, is practically straight and is lifted onto the shelf without the usual shock or jar, as the releasing lever is rolled along in the rack and imparts to the front rod a direct and gradual pick-up. The adjustment for various heights of dies is made by means of a knock-off clamped to the front rod, which permits of the use of any thickness of dies. The incline for the knock-off is so designed that no impact whatever is imparted to the front rod. These hammers are made with falling weights from 400 to 3,000 pounds.

"Safety as Applied to Engineering" will be the subject of an address to be delivered by Eugene C. Pettibone, safety inspector for Pickands, Mather & Co., Cleveland, at the meeting of the Cleveland Engineering Society on Tuesday, March 12. An illustrated lecture on "Technical Education" was delivered before this society by Prof J. F. Barker, principal of the Cleveland Technical high school, on Tuesday evening, Feb. 27.

A New High Speed Trolley

The Pawling & Harnischfeger Co., Milwaukee, has recently designed a new high-speed trolley for handling miscellaneous materials, including pig iron, rails, plates, bars, coke, etc. When fitted to a traveling bridge and provided with a single line grab bucket this trolley is specially suitable for unloading iron ore or coal from steamships; it may also be used for handling material between cars and ships. Fig. 1 shows two trolleys attached to traveling bridges, transferring rails from flat cars to a steamship at the docks of the Texas City Transportation Co., Texas City, Tex.

Fig. 2 shows a detailed view of the trolley, which is provided with a cage for the operator, but not shown in this illustration. The traveling speed of the trolley is about 700 feet per minute and the hoisting speed with a 5-ton load is 250 feet per minute. The mechanism is such that the same hoisting rope may be used with a hook or attached to a single rope grab bucket of the latch-open type. The rope guards on the bucket are arranged in such a way that they can readily be opened and the hoisting rope, which also performs the functions of a closing line for the bucket, readily inserted. The single line bucket may also be used with a holding line similar to that employed on a two-line bucket. This holding line is wound upon a drum operated by a motor just large enough to keep the slack out of the rope either going up or down. In this way it is possible to discharge the bucket at any desired height by means of a large foot-operated band brake on the holding drum. When the bucket is fully open and, therefore, latched, the foot brake is released and the weight of the empty bucket is again placed on the closing line, when it can be lowered without closing until it strikes the stock pile. The design was worked out in this manner in order to concentrate all the motor capacity on the large drum which is also used for the hook service. When the grab bucket is not in use, the holding line is disconnected and wound up on its drum, which then remains at rest. The holding drum motor performs about the same function as the spring in a curtain roller; it tends to run ahead of the hoist motor when going up and to lag behind the latter when going down. The holding line is never slack and cannot be jerked when the bucket is discharged.

In connection with the hook service, a lifting magnet of 2½ tons capacity is used. The feed cables for the magnet are wound up and paid out by a small motor-operated winding drum. The operation of this cable take-up is exactly the same as the holding drum mechanism.

The trolley is of the inside running type and is operated on a plate girder cantilever arm which can be moved out over the deck of the boat about 60 feet beyond the face of the pier.

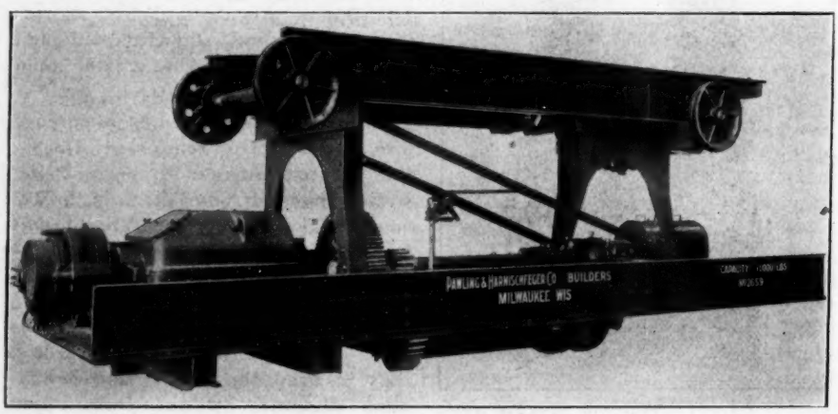


FIG. 2—THE 5½-TON TROLLEY

The reason for this peculiar construction lies in the fact that it is impossible to move a hinged apron of the ordinary construction through the rigging of large sailing vessels such as these unloading machines frequently have to serve; the great extenson of the cantilever is necessary in order to load or unload lighters tied up on the outside of the big vessel.

A 100-horsepower mill type motor is used for hoisting and a 35-horsepower railway type motor with a foot brake for travel. The hoist controller is of the magnetic switch-operated type with dynamic braking. The load is sustained by a disc motor brake of unusually large proportions and of a new design which will permit instant adjustment of the air gap.

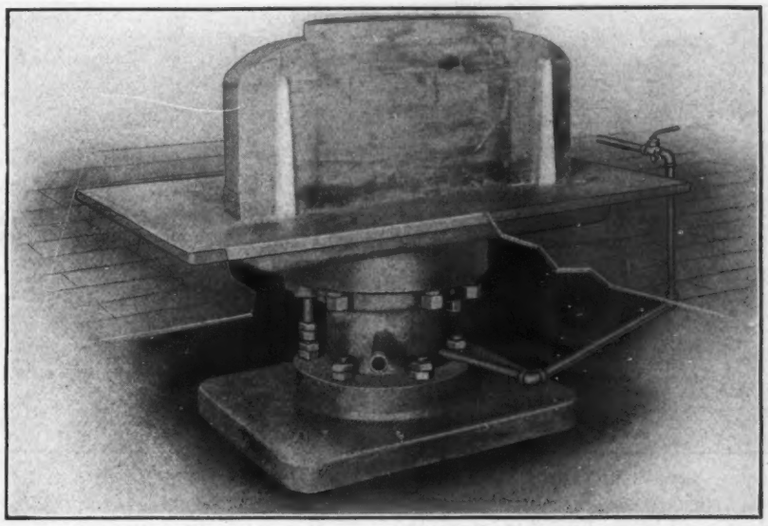


FIG. 2—JAR-RAMMING MACHINE WITH PATTERN PLATE AND PATTERN ON THE TABLE

A Plain Jar-Ramming Machine

A plain jar-ramming molding machine, which is exceedingly novel in design and construction, is shown in the accompanying illustrations. This machine is unique, as it contains no valves and is without ports other than the exhaust. The only valve required is that on the air line which controls the air supply to the machine. This molding device has been especially designed to effect operating economies and this has been accomplished by reducing the air consumption to the minimum and by the elimination of mechanism which might require frequent repairs. The base, cylinder and table are of heavy construction and have been designed to meet all the severe service requirements of the foundry.

The table, plunger, cylinder and base are separate castings, and studs in place of bolts or cap screws are employed to fasten together the plunger and table and the cylinder and base. All joints are scraped to insure an absolutely air-tight fit, thereby eliminating the use of gaskets. The contact surfaces of the jarring mechanism are large and form a concentric ring around the piston and at such distance from the center of the machine as to minimize the effect of unequal loading on the table.

Notwithstanding the fact that the machine shown in Fig. 1 is equipped with an 8-inch cylinder, the overall height, from the base to the top of the table, is only 21 inches. In Fig. 1 the exhaust pipe is shown at the left and air supply pipe, at the right. In this illustration the table has been raised to show the length of the stroke, which is 3½ inches, but machines are built also with a 5-inch stroke. Two adjustable stops are attached to the machine on either side, which also serve as guides, insuring perfect alignment. In Fig. 2, the machine is shown with a pattern plate and pattern on the table. The pattern has a depth of 16 inches, but notwithstanding the difficulties involved in molding a model of this form, molds have been successfully jar-rammed on this machine more satisfactorily and in much less time than could be done by hand. The flask in which this pattern was molded is 31 x 47 inches inside and 22 inches high.

This type of plain jar-ramming molding machine, which is equally well-adapted for making molds and cores, is built in all sizes by the U. S. Molding Machine Co., Cleveland, recently organized by J. N. Battenfeld.

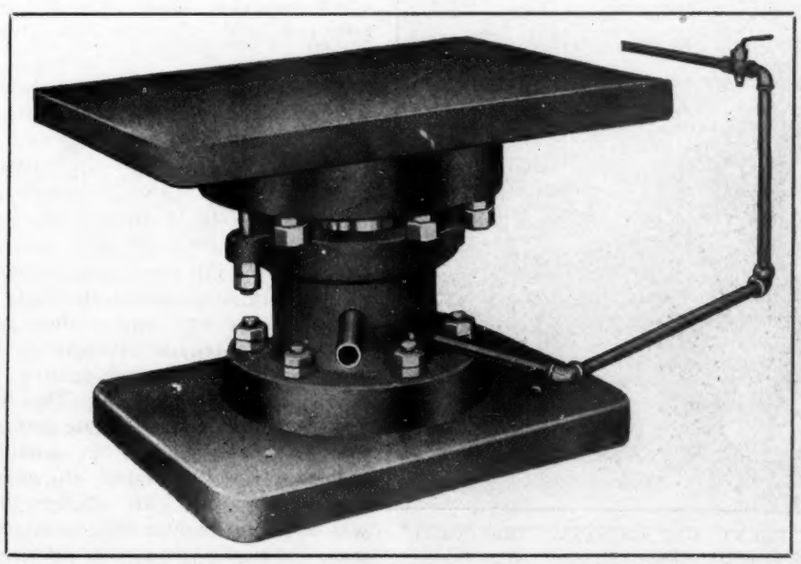


FIG. 1—PLAIN JAR-RAMMING MOLDING MACHINE WITH TABLE RAISED

While the production of pig iron in Germany has nearly trebled since 1890, the output of steel has increased six-fold. After allowance is made for the manufacture of cast and wrought iron and the export tonnage, there now remains annually from 9,000,000 to 10,000,000 tons of pig iron available for steel-making. To this must be added about 3,500,000 tons of scrap and about 1 per cent of iron ore allowing for loss in conversion, to produce the present output of steel. The native German phosphoric ores are well-suited for the Bessemer process, which accounts for about 62 per cent of the output, of which amount only about 5 per cent was acid steel. These ores are cheap, and the cost of producing steel therefrom is still further lessened by the fact that the basic slag, when ground, finds a ready market as a fertilizer.

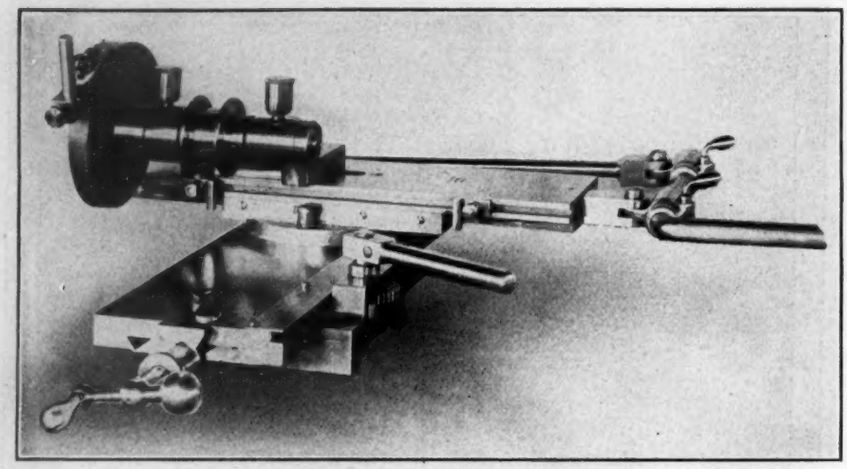


FIG. 1—EXTERNAL GRINDING ATTACHMENT FOR BENCH LATHES

External Grinding Attachments

In Fig. 1 is shown an external grinding attachment for bench lathes designed with a view to securing the greatest degree of rigidity for grinding with wheels 4 inches in diameter and ½ inch face. The grinding head may be removed and a head for internal grinding may be substituted. The spindle for internal grinding can be operated at speeds as high as 30,000 revolutions per minute. The circular swivel base is graduated in degrees to permit of grinding tapers. The lever movement is novel in that it is adjustable for quick, short strokes as well as for longer strokes. The movement of the top slide gives a range of 8 inches for work to be ground and is provided with adjustable stops. The cross movement is 7 inches from the center. The small lever over the micrometer feed screw is designed to release the feed and by means of the pinion and rack operated by the lever, the grinding head may be carried instantly away from or returned to the work, greatly facilitating the fitting of gages and the placing of the work. The emery wheel is covered and is provided with an adjustable tube to direct the flow of water in wet grinding.

Fig. 2 is a view of an external grinding attachment for a bench lathe for grinding irregular forms without the necessity of resetting for different angles. It is particularly adapted for grinding hardened steel paper cutters, one of which is shown in the foreground. This cutter has been ground on the plane, concave, and bevel in one setting. Fine adjustments have been provided throughout both for setting the wheel and to compensate for wear. The circular swivel base is graduated in degrees for setting the wheel for different classes of work. Both of these attachments are manufactured by the Remington Tool & Machine Co., Boston, and are designed for use with a bench lathe made by this company.

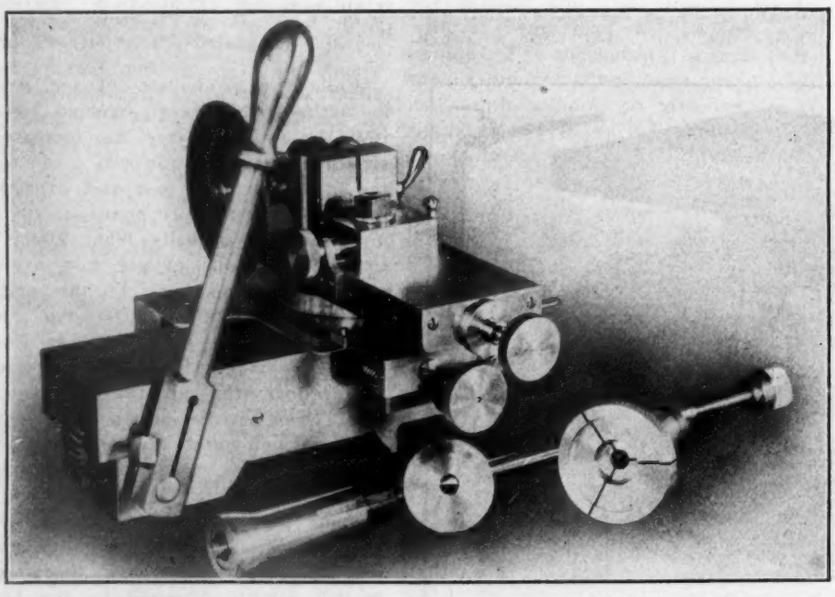


FIG. 2—EXTERNAL GRINDING ATTACHMENT FOR GRINDING IRREGULAR FORMS WITHOUT RESETTING

A New Boring Tool

The accompanying illustrations show a boring tool with adjustable cutters, which has been developed by the Matthews-Davis Tool Co., St. Louis. The details of this device are shown in Fig. 1, which illustrates a boring bar with two sets of cutters, one designed to take the roughing cut and the other a finishing cut. The diameter swept by the cutters may be regulated to 0.001 inch by the micrometer adjustment shown in the illustration. The micrometer screw carries a specially constructed double expanding wedge on its inner end which comes in contact with the cutters and holds them to the proper diameter.

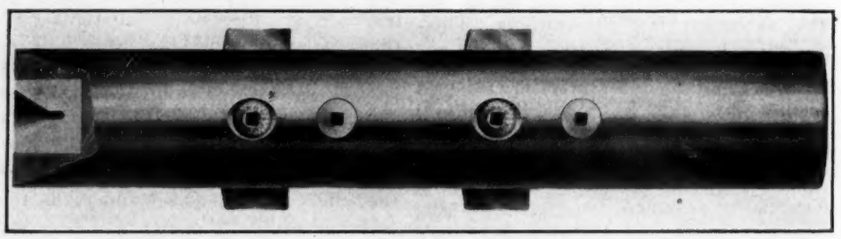


FIG. 1—DAVIS EXPANSION BORING TOOL

It is claimed that these boring tools require only six seconds for adjustment to compensate for wear. It is, therefore, possible to operate them at a speed which will cause the roughing cutters to wear down from 0.002 to 0.005 inch per hour.

A test of this tool was made in a shop at Bay City, Mich. It is stated that it was used to bore cast steel bevel gears, the diameter of the hole being 3 5-16 inches and the length of bore, 8 inches. The bore was completed in three cuts and the average time required to complete each gear was 10 minutes. Previously, using other tools, the average time was about 52 minutes. To meet varying conditions, these tools are made

in 21 sizes and in over 800 different styles. Fig. 2 shows how the tools are mounted on a turret lathe in pairs. One of them takes the roughing cut and the other, adjusted to a larger diameter, follows with the finishing cut.

A 32-Inch Cold Metal Sawing Machine

A rapid production crankshaft sawing machine, designed to reduce the usual setting time by operating two blades simultaneously, built by the Newton Machine Tool Works, Inc., Philadelphia, is shown in the accompanying illustrations. The sawing blade diameter is 32 inches and the capacity for sawing steel stock in one cut is 9½ inches or it can cut a depth of 9½ inches in the throats of crankshafts. When equipped with a milling cutter the machine also can finish the cheeks of crankshafts without sawing.

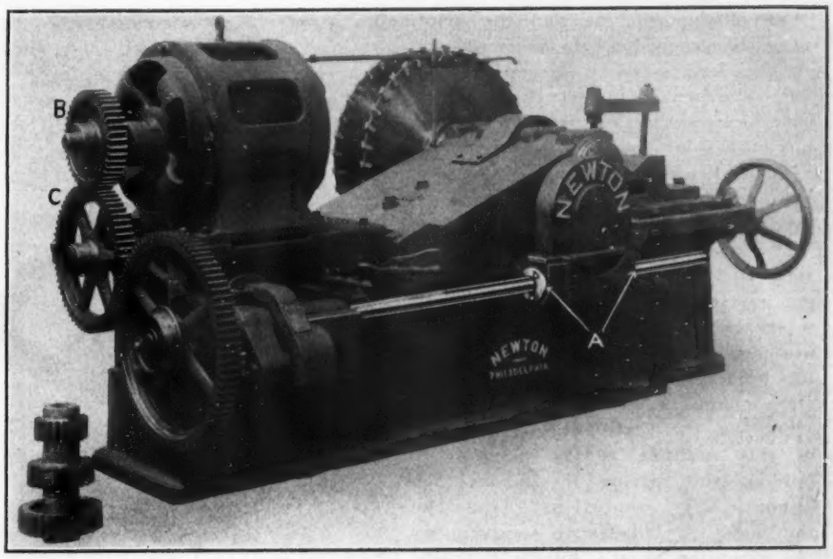


FIG. 1—CRANKSHAFT SAWING MACHINE, EQUIPPED WITH TWO BLADES

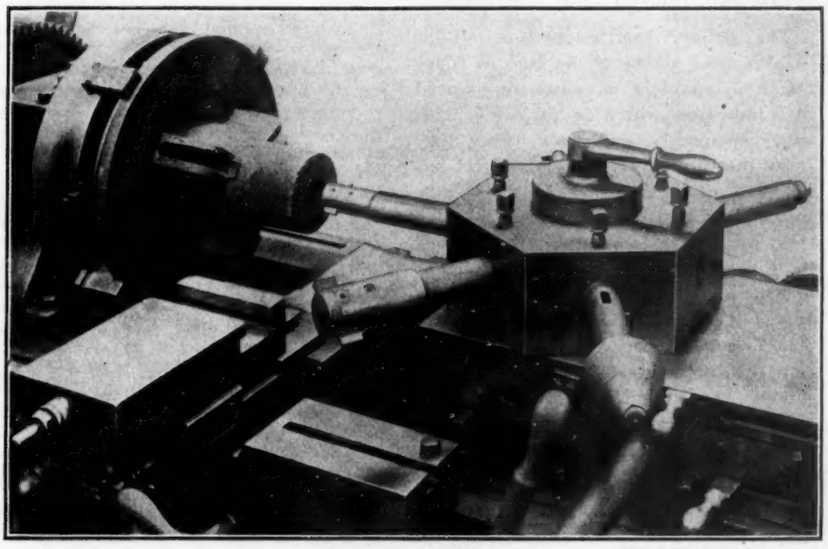


FIG. 2—EXPANSION BORING TOOL OPERATING ON A TURRET LATHE

This sawing machine is of the spindle-driven type, the spindle revolving in capped bearings with a driving gear between the bearings. The teeth of the pinion meshing with the spindle gear, are cut from the solid. The driving worm is a solid bronze casting and the worm wheel is made of hardened steel equipped with roller thrust bearings and both are encased for continual lubrication. To prolong the life of this bearing the splined shaft is provided with bushings which revolve with the shaft, as shown at *A*, Fig. 1, and prevent the escape of oil through the splines in the shaft. The three bearings on the pinion shaft are so arranged that the pinion is supported on both sides. The blade is held in position by three through bolts, adjusting nuts and collars being provided for taking up the side wear.

The saddle is of especially heavy box type construction, has square lock bearings on the base with underlocking gibs cast solid, with adjustment made by taper shoes. To insure the constant and positive forward movement of the saddle under the heavy stresses to which the machine is subjected, a gear feed box has been attached, giving six changes of feed and in addition there is a power with positive and adjustable automatic stops to release the feed and fast traverse at any predetermined point, and also to insure the release at the end of the traverse.

The machine is driven by a 20-horsepower induction motor operating at a speed of 720 revolutions per minute and the speed variations are obtained by changing the motor gear, *B*, Fig. 1. The intermediate gear, *C*, is mounted on a swing arm. The operating levers are located at the

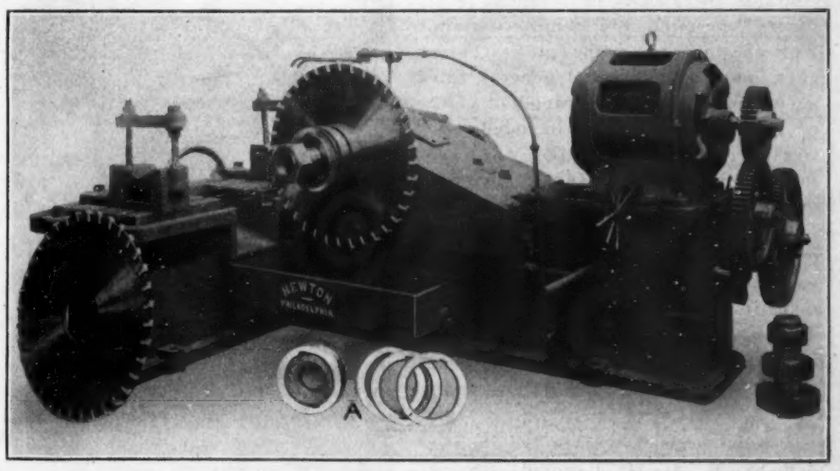


FIG. 2—OPERATING SIDE OF CRANKSHAFT SAWING MACHINE

front of the machine and the hand wheel is attached to the squared end on the feed screw to permit of its removal when it interferes with overhanging or projecting work. The feed screw has a bearing at each end to permit of maintaining it in tension, which is an essential feature to assist in the elimination of vibration.

The work table is provided with T-slots and is surrounded by an oil pan cast integral with the table, while in the center of the table clearance is provided for the blades. The V-blocks for holding the work have swinging strap clamps.

One of the distinguishing features of this machine is the method of holding and driving the blades. To minimize the proportionate error in the fit of the blades to the spindle, the extension to the spindle is made of proportionately large diameter and on the machines shown in Figs. 1 and 2, is 8 inches. The blades are driven by two broad keys shown in Fig. 2 and the blades and collars are held in place by a hexagon nut, 4 inches in diameter. The maximum gap between the blades is 4 inches and the spacing washers provided permit of different combinations with variations of 1 inch. A number of these washers are shown underneath the oil pan, Fig. 2, and at *A* is the heavy washer against which the nut is adjusted. The machine is furnished complete with pump, piping and attachments for cutter lubrication, the rear end of the base serving as a tank for the lubricant.

Coal Operations in West Virginia

A map-directory of the coal operations in West Virginia has been compiled, which shows not only the location of every operating mine in West Virginia and in the two coal mining counties in Maryland, but in addition contains the names of over 500 companies operating 815 mines, together with the names of the general manager, purchasing agent, general sales agent and mine superintendent. Other information is also included relative to the thickness of the vein mined, kind of opening, haulage, method of mining, number of men employed, coke ovens operated, capacity of mine, grade shipped, trade name of coal and its analysis. The map is 32 x 36 inches. The map-directory will be delivered postpaid for $5 by E. B. Day, 108 Smithfield street, Pittsburgh.

A process recently patented in Sweden by N. K. H. Ekelund provides for the utilization of peat in the form of a powder, for the reduction of iron ore in the electric furnace. The powder is mixed in equal quantities with crushed iron ore, and the gas generated by the reduction is diverted and used under the boilers.

FIG. 1—FRONT VIEW OF ILLUMINATED DIAL INDICATOR

An Illuminated Dial Indicator

The Brown Instrument Co., Philadelphia, has added to its line of electrical pyrometers a new illuminated dial indicator which is provided with an exceptionally long scale. Frequently an instrument is required which can be read easily by the operator of a furnace or kiln at some distance, and this pyrometer, with the illuminated dial, has been designed for this use. The new instrument, shown in Figs. 1 and 2, has a scale 12 inches long, which can be furnished with or without the illuminated dial, as desired. Where the illumination is sufficient, the instrument does not require an illuminated dial, as the long dial affords very open graduations and insures accurate readings. In many plants, however, where the work is carried on day and night, the illuminated instrument is recommended. The scale is drawn on opaque glass and a 16-candlepower lamp is placed behind the scale.

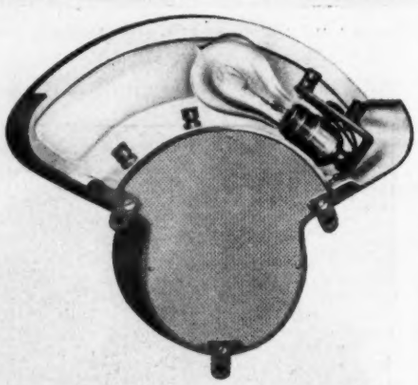


FIG. 2—BACK VIEW OF ILLUMINATED DIAL INDICATOR

New Catalogs

MULTIPLE DRILLING MACHINE.—In a four-page bulletin, the Langelier Mfg. Co., Providence, R. I., illustrates and describes a multiple drilling machine provided with three interchangeable heads containing respectively 44, 24, and 16 spindles. Plans showing the layout of the spindles in the heads are included.

MOTOR TRUCKS.—The National Motor Truck Co., Bay City, Mich., in a 32-page catalog, illustrates and describes the motor truck which it manufactures for a varied line of service. The weight of these trucks without body is 2,400 pounds and the wheel base, 104 inches. The construction of these trucks is well-illustrated by line drawings. Shop views of the various departments of this company's plant are included, which show the extensive manufacturing facilities of this concern.

RIB-LATH AND RIB-STUDS. — The Trussed Concrete Steel Co., Detroit, has issued a booklet devoted to its rib-lath for stucco and plaster in sidings, ceilings and furring, and its rib-studs for hollow walls and hollow partitions. These products are recommended for use in reinforced concrete buildings of all kinds and, considering fireproofness and permanence, are claimed to be more economical than wood. Rib-lath consists of a series of parallel steel ribs, which are deeply corrugated or beaded. It may be furnished either in open-hearth steel or in acid-resisting ingot metal. The booklet contains various illustrations of buildings in which rib-lath and rib-studs have been used.

TRACK BOLTS AND SPIKES.—The Inland Steel Co., Chicago, has issued a booklet devoted to its open-hearth steel track bolts and track spikes, the manufacture of which is controlled by that concern from the ore to the finished product. The bolts may be furnished with rolled or cut ratchet grip or United States standard threads, and with square or hexagon nuts, United States standard, recessed or special recessed. The heads are standard unless otherwise ordered. The bolts range in length from three to 12 inches, in diameter from 5/8 to 1 1-16 inches, and are packed in 200-pound kegs. The track spikes are likewise sold in 200-pound kegs and are made in the following sizes: 5/8 x 5½ inches, 6 x 6½ inches, 9-16 x 5 inches and 5½ x 6 inches. The booklet also contains a list of prices.

AUTOMATIC CONTROL FOR MOTOR DRIVE.—An eight-page bulletin, issued by the Reliance Electric & Engineering Co., Cleveland, is devoted to this company's automatic starting control for motor-driven machinery. This controlling device has a wide application and illustrations are included in the bulletin showing this equipment attached to a boring mill, shaper, lathe, upright drill, car wheel boring machine, vertical milling machine, woodworking machines, etc. It is claimed that with automatic starters it is possible to use a powerful dynamic brake, causing the quick-stopping of the motor and spindle of the driven machine. This automatic starting element can be attached to a post or to the wall, as far away from the machine as desired, with absolutely no exposed contacts on the tool itself. If the main switch for closing the circuit is located on the machine, this is furnished in the form of a small, fully-equipped drum. If magnetic type switches are used, these can be located away from the machine on the same panel as the automatic starter.

IRON AND STEEL SECURITIES

Trading on the New York stock exchange continued exceedingly dull the greater portion of last week, but the tone of the market was stronger and the majority of the securities listed showed fractional gains.

Monday the market was heavy and dealings were light, prices averaging slightly lower. Tuesday, the market was dull, but prices averaged slightly higher; foreign markets were firmer. Wednesday, trading was active and prices advanced 1 to 2 points; wheat advanced 2 cents; foreign markets disturbed by prospects of coal strike in England; Berlin again bid 4¼ per cent for two-month loans in New York. Thursday, stocks were less active with prices averaging lower; the answer to the Steel Corporation was filed by the law department of the government; 800,000 coal miners went on strike in England. Friday, the market was active, firm and higher, Steel common leading the movement; copper stocks were strong in response to an advance in the price of the metal; foreign markets firm. Saturday, stocks were dull but firm; English consols went ⅜ lower due to the coal strike.

Money on call ranged between 2½ and 2 per cent. Time money was offered freely, but concessions were made only on the part of borrowers. The actual condition of clearing house institutions showed loans increased $10,010,000; net deposits increased $5,732,000; total reserve $455,983,000, and the excess of reserve $22,810,300, a decrease of $5,388,900. Non-member banks and trust companies showed loans decreased $5,348,500; net deposits decreased $1,262,300; reserve on deposits increased $229,100, and the percentage of reserve 19.6, unchanged from the week previous. Bank clearings showed an increase over the previous week of 19.1 per cent, but a decrease of 4.3 per cent from the corresponding week last year. Commercial failures numbered 366, compared with 290 the preceding week and 291 the corresponding week last year. Shares were sold to the number of 1,772,460 compared with 983,320 the preceding week and 2,446,600 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $11,791,000, compared with $8,406,000 the preceding week and $12,533,000 the corresponding week last year.

	Clos'g Quo. Mar. 2	Changes in week	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend—Last Dividend	Dividend—Date Last Div. Pay
Allis-Chalmers	7⅛	— ⅜		$19,820,000		.....	
Allis-Chalmers, pr	4	—2½		16,050,000	7 cum.	1¾ Q.	Feb. 1904
American Can	12⅛	+ ½	Feb. 6	41,233,300		.....	
American Can, pr	92⅝	+ ⅜		41,233,300	7 cum.	1¼ Q.	Apr., 1912
Am. Car & Fdy	53	+2¼	June 27	30,000,000	2	½ Q.	Jan., 1912
Am. Car & Fdy., pr	115⅛	+ ⅛		30,000,000	7 n. c.	1¾ Q.	Apr., 1912
American Loc	33¼	+ ¾	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	105⅛	+1⅛		25,000,000	7 cum.	1¾ Q.	Jan., 1912
American Ship	50	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	102	— ¼		7,900,000	7 n. c.	1¾ Q.	Jan., 1912
Am. Steel Foundries	28	.....	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	15	.....	June 4	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	29⅞	— ⅛	April 2	14,862,000		.....	
Bethlehem Steel, pr	59⅞	+1		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	41¾	— ¾	Mar. 19	45,000,000*	5	1¼ Q.	Feb., 1912
Cambria Iron	45	.....		8,468,000*	4	2 S. A.	Apr., 1912
Chicago Pneumatic Tool	46¾	+ ¾	Feb. 19	6,448,800	4	1 Q.	Jan., 1912
Colorado Fuel	26	+1⅜	Oct. 21	34,235,500		1¾ Q.	April, 1902
Crucible Steel	10½	.....	Nov. 15	24,578,400		.....	
Crucible Steel, pr	81¼	— ¼		25,000,000	7 cum.	1¾ Q.	Dec., 1911
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr	36	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Feb., 1912
General Electric	162⅛	+2⅛	May 14	77,281,200	8	2 Q.	Jan., 1912
Harbison-Walker	40	.....	Jan. 15	18,000,000	2	½ Q.	Mar., 1912
Harbison-Walker, pr	100	.....		9,600,000	6 cum.	1½ Q.	Jan., 1912
International Pump	28	.....	Dec. 10	17,762,500		½ Q.	Apr., 1905
International Pump, pr	80½	+ ½		11,350,000	6 cum.	1½ Q.	Feb., 1912
Lackawanna Steel	30	.....	Mar. 13	34,978,000		.....	
Lake Sup. Corp	29¼	— ¼	Oct. 2	40,000,000		.....	
New York Air Brake	50	—3½	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,000	6	1½ Q.	Mar., 1912
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Feb., 1912
Otis Elevator Co	73	.....	Mar. 18	6,358,600	4	1 Q.	Jan., 1912
Otis Elevator Co., pr	101	+ ½		6,375,300	6 n. c.	1½ Q.	Jan., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr	100	.....		20,587,500	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	17¼	+ ¼	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr	79	.....	Oct. 7	27,071,800	7 cum.	1¼ Q.	Jan., 1912
Pittsburgh Steel Co., pr	131¼	— ¼	Feb. 21	7,000,000	7 cum.	1¾ Q.	Mar., 1912
Pressed Steel Car	30	.....		12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	97	—1	Nov. 13	12,500,000	7 n. c.	1¾ Q.	Feb., 1912
Pullman	159	.....	Mar. 7	120,000,000	8	2 Q.	Feb., 1912
Railway Stl. Spring	27¾	+ ¾		13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	102½	— ½	Oct. 16	13,500,000	7 cum.	1¾ Q.	Mar., 1912
Rep. Iron & Steel	19	+2½		27,191,000		.....	
Rep. Iron & Steel, pr	69½	+1¼	Mar. 13	25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	40	.....		10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....	June 26	6,700,000	7 n. c.	1¾ Q.	Jan., 1912
U. S. Pipe & Fdy. Co	14⅞	+ ⅝		12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	51¼	+ ¼	April 15	12,500,000		1¼ Q.	June, 1911
U. S. Steel	61⅜	+1⅜		508,302,500	5	1¼ Q.	Mar., 1912
U. S. Steel, pr	108¼	— ⅛		360,281,100	7 cum.	1¾ Q.	Feb., 1912
U. S. Steel 5s	103	+ ⅛	Sept. 17	465,189,500	5	.....	
Va. Iron, Coal & Coke	55	—3	Oct. 1	9,073,680		5. †	Oct., 1907
Westinghouse Air Brake	160	—2	June 12	14,000,000*		5 Q.‡	Jan., 1912
Westinghouse Electric	73½	+ ½		3,998,700*	7 cum.	1¾ Q.	Jan., 1912

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 68, a net gain of 1½.

Boston.—Butte Coalition closed 22¾, a net loss of ¼; Calumet & Arizona closed 61¼, a net gain of ¼; Calumet & Hecla closed 460, a net gain of 20; North Butte Mining closed 26½, no change; Quincy Mining closed 79, a net gain of 2.

Financial Notes.

The American Can Co. has declared the usual quarterly dividend of 1¼ per cent on preferred stock, payable April 1.

The Railway Steel Spring Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable March 20.

The National Lead Co. has declared its usual quarterly dividend of ¾ per cent on its common stock, payable March 20.

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Cleveland, March 7, 1912

Finished Steel Contracts

It is an old tale that contracts in the finished steel trade amount to nothing. At best, they are options. Not only does the buyer not take out the entire tonnage for which he has made contract, if his requirements fall below the amount, but he does not even take under the contract what he does require, if he can buy against his requirements at a lower price from another producer.

What is worthy of special attention at this time is that the conditions which had a tendency to justify the practice of regarding a steel contract as an option have disappeared. We do not admit that the practice was justifiable on the whole, but merely that there were certain arguments tending to justify it. These existed only when there was a controlled market, when there was a recognized price from which sellers, each acting according to his individual judgment, did not usually depart. In such circumstances, there was always the possibility of a break, and buyers were indisposed to make contracts unless protected against breaks. If they did not make contracts, they would buy from time to time, and this would put the market under greater pressure than if contracts were in existence.

With the passing of that description of market, with the institution of a wide open and highly competitive market, the only arguments tending to justify the regarding of a contract as an option disappeared. The steel trade has been acting as if it did not realize this fact.

In present market conditions in the steel trade, there is absolutely no valid reason why contract obligations should not be fulfilled to the letter. There is no occasion to urge this point, however, because the violations are so wide that much improvement could be made without absolute adherence being required. For instance, if the buyer meet with business reverses and be unable to use the material, an arrangement to relieve him temporarily or permanently could be made without serious harm. What is most reprehensible, and what urgently calls for abolition, is the practice of buyers requiring sellers with whom they have contracts to meet new prices which are made, or are alleged to be made, by competitors. The seller under a contract is placed in the position of being required to furnish the material at the low price if the market advances, but to sell it at a lower price if any seller in the trade chooses to name a lower price. He is not only placed in that position, but he is also placed in the position of having continually to be on guard against misrepresentations. It would be bad enough if the seller had to meet the lowest price going; frequently he is injured still more by being induced to let his material be billed at a price lower than actually has been quoted by any responsible seller.

It is idle, of course, to speak of the possibility of concerted action among steel producers to eliminate the practice, but there is not lacking the force of example for the institution of reform. Some companies have not only been preaching, but practicing, that "a contract is a contract". The trouble is that the example is not followed by all sellers.

An Expression of Loyalty

While the total figures have not been fully received and will probably not be made public before the annual report of the United States Steel Corporation is issued in the near future, it has been stated unofficially that the subscriptions for stock by the employes of the leading steel interest under the profit sharing plan of 1912 are the heaviest in history and will greatly exceed the number of shares set aside for this purpose. The announcement of the profit sharing plan for this year made several months ago, stated that 25,000 shares were offered to employes under the terms of $110 for the preferred and $65 for the common. The number of shares which any employe may receive is limited in proportion to his salary and it is expected that full subscriptions from the lower salaried employes at least will be filled this year. In view of the dissolution suit against the Steel Corporation instituted by the government, the unusually heavy response of the employes for stock subscriptions is a genuine expression of confidence and loyalty.

Necessity for Expert Knowledge

Every industry is highly specialized and the necessity of expert knowledge and impartial, thorough investigation was never made more apparent than during the recent hearings before the senate committee on finance relating to the Underwood tariff bill.

Take the chemical schedule, for instance. It involves a book of over 300 pages and there is not a man on the committee that even knows the meaning of one-half of the words embraced in the schedule, to say nothing whatever of the industry which they represent. When the machine tool interests appeared before the committee, they were startled to have one of the members of the committee inquire if a hatchet was a machine tool. The inquiry was soberly meant, too.

Nor can anyone with an open mind attend these hearings without leaving with the absolute conviction that the protective policy is necessary to the continuation of American industry. If duties are reduced as proposed, it is certain that wages will be reduced and everyone can realize what hardship that would entail.

During the hearing on the metal schedule, the

general impression created by the iron and steel manufacturers was one of absolute fairness. As is well known, the iron and steel business has not been profitable during the past two or three years, except to a few companies. In fact, it has not been a profitable business since the Payne act went into effect in 1909, and that is one of the really important points advanced. The iron and steel men do not know whether the duties of the Payne act are enough; the measure has never been tested, owing to the fact that a boom condition has existed in the industry abroad during the past two years and a depressed condition here. The foreign manufacturer's home market has, therefore, been more inviting to him than the American market.

Eggs, Turnstiles and Other Things

Mr. McRae, who came from obscurity into the limelight last week, appeared not merely in the humble guise of the bookkeeper, or even as an expert, but—behold him—as a philosopher—shall we say of folly? No, of great business policies and principles. It is natural, of course, to expect him to pose as an expert, and, as *The Daily Iron Trade Review* remarked, it was compulsory of him in earning his salary to find some sort of an African in the Corporation's mathematical wood pile. No one, however, was prepared for the numerous suggestions and observations made by this man of statistics. He had a great deal to say about the Gary dinners, and it is really surprising that he did not express some opinion as to the character of the viands served and the plate used at those functions.

It is interesting to note how Mr. McRae's report was received by some editors. The socialistic editor of the *Chicago Tribune* is greatly troubled about Mr. Morgan's fee. Under the caption, "Scrambled Eggs", the *Tribune* says:

> For bringing together the constituent companies of the United States Steel Corporation, an expert accountant, after investigation, reports to the house steel inquiry committee that J. Pierpont Morgan and his partners received a cash profit of some $70,000,000.
>
> A pretty price for scrambling eggs!
>
> What justification is there for such a profit on such an act?
>
> What brain earns a reward like that?

Then, after telling about how other folks of more or less eminence failed to make that much money, the editor sees visions of the ponderous form of Mr. Morgan standing—no, not in the pathway of progress. That is too stereotyped an expression. J. Pierpont is actually blocking the turnstile of the land of opportunity. Listen to this:

> If America is to remain a land of opportunity, a land of widespread prosperity based on productive industry, of real freedom—political, social and economic freedom—we must make an end of a system which fosters a Morgan and lets him stand by the turnstile of opportunity to exact such tribute.

The New York Times refuses to become panic stricken and remarks that there is nothing new or scandalous about the $69,000,000 fee. It says:

> When a billion-dollar corporation is to be floated, the success of its security issue must be assured by underwriters capable of carrying the matter through, for failure would bring disaster upon the financial and industrial world. When the results produced are worth countless sums, not only to the Corporation, but to the entire steel trade, and in a sense to the entire nation, the job must be said to be worth the price. Sixty-nine millions is not a high price for producing a decade such as followed the formation of the trust, compared with a repetition of such a decade of bankruptcy and starvation and uncontrolled, uneconomic competition as preceded. The comparison of the two decades is answer enough to all the allegations anybody has ever made. Where is the laboring man who wishes the trust destroyed in order that his wages may be reduced? Where is the consumer who wishes the trust destroyed in order that prices may rise to the height reached before the trust was formed, and which never since has been reached?

Adopting the words of *The Daily Iron Trade Review*, we say, "stripped of all his official glamor and standing forth in his true light, McRae is nothing more than a bookkeeper groping and wallowing around in the pettiest kind of politics." It is really surprising how much politics there is in the country at the present time, and how it interferes with getting sane views and real facts on any subject.

Our Annual Ore Statistics

The past year was not a record breaker in the tonnage of ore moved from the Lake Superior region, but it was nevertheless a period of interesting developments, which are described fully elsewhere in this issue. The adaptability of a mighty organization to changing conditions was never so impressively exhibited as during the past year, when the Oliver Iron Mining Co. increased its shipments from the Hill ore lands from 2,152,977 tons in 1910 to 5,499,759 tons in 1911, and prepared to make still greater shipments this year, so that it will not be surprising if 8,000,000 tons are moved from the Hill ore lands this year, thus making up the shortage which now exists under the lease. It is understood that the Steel Corporation expects to increase its shipments about 4,000,000 tons this year, as compared with last year, making this year's shipments about equal to those of 1909, when 21,397,866 tons were moved.

For many years, THE IRON TRADE REVIEW has published iron ore shipments on a sheet 20 x 16 inches. This form of presentation has proved to be somewhat inconvenient to those who have most frequent use for the statistics, and this year the detailed statistics will be published in pamphlet form, giving all the information published in this issue of THE IRON TRADE REVIEW with additional statistics of value.

Heavy Movement From Hill Ore Lands

Corporation Trying to Ship Required Tonnages Before Lease Expires—
Shipments from Lake Superior Mines—Some Remarkable Changes

Ore shipments cannot always be taken as a barometer of trade conditions. In spite of the discouraging conditions that prevailed during a considerable part of the year 1910, record breaking shipments were made, the total being 43,442,397 tons. Last year, the shipments were 32,793,130, a decrease of 10,649,267 tons, the movement being by lake 32,130,411 tons and by rail 662,719 tons. This was, however, a heavier movement that was justified by trade conditions and would have been decreased except for the great activity of the Steel Corporation in mining ore from the properties covered by what is commonly known as the "Hill ore lease." Under the terms of this lease, the Corporation is required to mine the following tonnages:

1907	750,000
1908	1,500,000
1909	2,250,000
1910	3,000,000
1911	3,750,000
1912	4,500,000
1913	5,250,000
1914	6,000,000
1915	6,750,000
1916	7,500,000
1917	8,250,000

From 1907 to and including 1910, the Corporation was required to mine 7,500,000 tons, but it actually shipped only 2,332,379 tons. Hence, at the beginning of last year there was a shortage of 5,167,621 tons, and the Corporation had 3,750,000 tons to bring down for the year 1911. In order to have made up the deficit and ship the minimum for 1911, it would have had to move 8,917,621 tons. It did move, in 1911, 5,499,759 tons. As the total movement from the Hill properties up to Jan. 1, 1912, was 7,832,138 tons, and the minimum required 11,250,000 tons, the shortage now is 3,417,862 tons. In order to make up this shortage and move the minimum for 1912, the movement for this year must be 7,917,862 tons, and for the full period from Jan. 1, 1912, to Jan. 1, 1915, when the lease expires, it must be 19,167,862 tons.

It is important for the Steel Corporation to mine as great a tonnage as possible before the expiration of the lease not only because it is required to pay royalties on the minimum tonnages, but also because it has expended a number of millions of dollars in installing ore handling machinery on the Hill lands.

The principal shippers from Hill lands last year and this year, are as follows:

	1911	1910
Dale	1,002,292	.....
Harold	281,293	27,711
Hill	1,550,568	801,088
Leonard	1,293,463	795,431
Mace	124,721	15,267
Mississippi	328,601	36,581
North Uno	479,315	341,939
South Uno	266,390	.....
Total	5,326,643	2,018,017

In the answer of the United States Steel Corporation and others to the government suit, published in THE IRON TRADE REVIEW, Feb. 1, the defendants admit that under the terms of the lease the cancellation cannot take effect until Jan. 1, 1915, and that there is no limitation in the lease upon the amount of ore that can in the meantime be taken out by the Steel Corporation. They say, however, that it is physically impossible to mine any quantity of ore from said leased lands, in excess of the minimum specified, during the years 1912, 1913 and 1914, and that it is doubtful whether during those years even the full amount of the minimum can be mined. The shipments made by the Corporation from the Hill properties are as follows:

Year.	Tons Shipped.	Average per cent iron.	Average Royalty.
1907	137,270	58.7641	$ .838726
1908	508	65.1498	1.180295
1909	41,624	56.4001	.792687
1910	2,046,970	56.9633	.853830
1910	106,007	—49.00	.30
1911	5,344,078	58.2148	.945308
1911	155,681	—49.00	.30
	7,570,450	57.8769	.917818
	261,688	—49.00	.30
	7,832,138		

It will be noted that only 261,688 tons of ore running less than 50 per cent in iron have been mined.

Important Changes

The year was characterized by some marked decreases and increases. On the Mesabi, the production of the Adams decreased from 1,258,295 tons to 411,268 tons. The Biwabik produced less than half in 1911, of the tonnage of 1910. One of the most surprising decreases was that of the Burt, which fell from 1,032,815 tons in 1910, to 56,506 tons in 1911. The famous old Fayal declined from 1,485,099 tons to 434,364 tons. On the other hand, the Genoa increased from 283,299 tons to 923,477 tons. The Hull-Rust declined from 3,189,975 tons to 496,977 tons. The Morris, after being in the million-ton class since 1905, dropped from 1,364,673 tons to 40,481 tons. The Sauntry-Alpena is one of the surprises of the year, increasing from 242,373 tons to 1,057,819 tons. The great Stevenson property, which left the million-ton class in 1910, dropped last year, to 500,323 tons, the lowest output since the year of its opening, 1900. The Virginia group, of the Oliver Iron Mining Co., declined from 992,389 tons to 648,588 tons, and the Virginia mine of Pickands, Mather & Co., from 299,046 tons to 97,667 tons.

On the Gogebic, the most noteworthy changes were the decreased productions of the Newport and the Norrie group. On the Menominee, marked decreases are shown by the Baltic, Florence and Loretto, while the Riverton group and the Zimmerman made handsome increases. On the Marquette, the Cleveland-Cliffs group declined from 955,374 tons to 344,950 tons, and the Maas from 208,103 tons to 24,927 tons. The Negaunee declined from 348,818 tons to 140,406 tons, making the lowest production since 1900. On the Vermillion the Sibley production fell from 206,386 tons to 1,899 tons, while the Zenith increased from 283,320 tons to 448,295 tons, making the highest production in its lifetime of 20 years. In the miscellaneous class, the Mayville produced 98,627 tons, the highest output since it began shipping in 1893.

Idle Mines

There is an unusual list of idle mines. The mines producing in 1910 and non-productive in 1911 are as follows:

Mesabi: Alexander, Bray, Duluth, Forest, Gilbert, Hartley, Humphrey, Jordan, Knox, Meadow, Nassau, Roberts, Seville, Silverton, Spring, Sweeney, Syracuse, Troy, Wills, Yawkey.

Gogebic: Atlantic, Harmony (Germania), Iron Belt, Mikado, Pike, Puritan, Winona.

Menominee: Commonwealth, Lamont (Monitor), Michigan, Quinnesec.

Marquette: Champion, Hartford, Mitchell, Portland.

Production by Ranges

In the past year the Mesabi range added slightly to its relative production, its percentage being 67.37 in 1911, compared with 67.22 in 1910. The Marquette reached its highest total in 1910, with 4,392,726 tons, thereby exceeding 1909 by 136,554 tons. This year, the Marquette drops to 2,833,116 tons. The Mesabi shipped 22,093,532 tons, compared with 29,201,760 in 1910. The Gogebic, like the Marquette, made a new record in 1910, shipping 4,315,314 tons, but last year it dropped to 2,603,318. The Menominee made its record in 1909, when it shipped 4,875,385 tons, while last year it shipped 3,911,174 tons, a rather good showing for a lean year. Its percentage of the total shipments was 11.93, compared with 9.75 in 1910. The Vermillion also slightly increased its percentage of the total, from 2.77 in 1910, to 3.32 in 1911. Its shipments declined only 114,247 tons. The Cuyuna range appears for the first time in our statistics, with a production of 147,431 tons from the Kennedy mine. The accompanying table and chart show the percentage of production of the various ranges in the years named.

Table Showing Range Percentage of Production

	1890	1895	1900	1905	1908	1909	1910	1911
Marquette range	33.25	20.08	18.12	12.26	09.28	09.99	10.12	08.64
Menominee range	25.35	18.42	17.09	13.07	10.30	11.45	09.75	11.93
Gogebic range	31.63	24.39	15.07	10.78	10.38	09.60	09.93	07.94
Vermillion range	09.77	10.32	08.68	04.88	03.23	02.61	02.77	03.32
Mesabi range	.....	26.63	40.93	58.63	66.34	66.16	67.22	67.37
Cuyuna range	.....	.....	.....	.....	.....	.....	.....	00.45
Miscellaneous	.....	00.16	00.11	00.38	00.47	00.19	00.21	00.35

The United States Steel Corporation's percentage was 52.7, or 2.8 per cent more than in 1910. The shipments of the Oliver Iron Mining Co. in the past six years, and the percentages of the total, have been as follows:

Year.	Shipments.	Percentage.
1906	20,414,811	53
1907	22,710,898	56
1908	14,123,957	56
1909	21,397,866	50.36
1910	21,661,143	49.86
1911	17,282,499	52.7

The Million-Ton Mines

The aristocracy, or if we may be permitted to coin a word, the tonocracy of the Lake Superior region, shows the following mines which shipped more than a million tons: Canisteo, Dale, Hill, Leonard, Mahoning and Sauntry-Alpena, all on the Mesabi range.

The Hill mine, in its second year as a producer, led all other mines with a production of 1,550,568 tons. Of the six mines producing a million tons or more each, the Mahoning is the only one that attained the figure before 1911. In 1910, there were nine mines in the million-ton class, they being the Adams, Burt, Canisteo, Fayal, Hull-Rust, Mahoning and Morris on the Mesabi and the Newport and Norrie group on the Gogebic. The Hull-Rust had produced more than 3,000,000 tons annually for four years previous to 1911.

New properties are the following:

On the Mesabi: Cavour, Dale and South Uno, from which shipments were made by the Oliver Iron Mining Co.; the Platt, a Hanna property; the Ruddy, of Todd-Stambaugh & Co., and the Whiteside of the Shenango Furnace Co.

On the Gogebic: the Asteroid, of Oglebay, Norton & Co.

On the Menominee: the Chicagon, of the Rogers-Brown Iron Co.; the Davidson, a Hanna property, and the Wickwire, of the Wickwire Steel Co.

On the Marquette: the Gwynn, and the Lloyd, of the Cleveland-Cliffs Iron Co.

On the Cuyuna: the Kennedy, of the Rogers-Brown Iron Co.

There are 13 new mines and 14 new shippers, counting the Milwaukee-Davis, which had not shipped since 1896. Last year there were 16 new mines, 13 being on the Mesabi. Shipments for new mines in 1911 amounted to 1,770,527 tons. Shipments from new mines in 1910 totaled 1,734,044. Shipments from Canadian mines were as follows: The Helen, of the Lake Superior Corporation, 128,628 tons; the Moose Mountain, of Oglebay, Norton & Co., 6,678 tons. In 1910, the shipments were: Helen, 115,790; Moose Mountain, 72,470. These figures are not included in our totals for Lake Superior ores.

There were 184 shippers in 1911, compared with 196 in 1910, and 172 in 1909. Ninety, or almost one half of the shippers, were on the Mesabi range. The Menominee was second with 38, the Marquette having 29, the Gogebic 17, the Vermillion seven and the Wisconsin and Cuyuna districts, three.

The following table shows the average production of the mines on the five leading ranges during 1911:

	Average mine production.
Mesabi range	245,483.69
Vermillion range	155,561.43
Gogebic range	153,136.35
Menominee range	102,925.63
Marquette range	97,693.65
Lake Superior district	178,223.37

SHIPMENTS BY MINES 1911

MESABI RANGE.

Adams	411,268	Leonard	1,293,463
Adriatic	73,280	Leonard-Burt	100,723
Agnew	153,425	Leonard-Glen	82,739
Albany	132,572	Lincoln	208,556
Alberta	22,108	Mace	124,721
Bangor	119,538	Madeira	56,075
Bessemer	179,051	Mahoning	1,011,945
Biwabik	211,071	Malta	13,608
Brunt	136,531	Mariska	2,367
Burt	56,506	Miller	282,636
Canisteo	1,340,378	Minnewas	295
Cavour	1,104	Minorca	67,942
Chisholm	721,784	Mississippi	328,601
Clark	503,999	Mohawk	121,822
Commodore	294,787	Monica	112,952
Corsica	63,940	Morris	40,481
Crosby	18,439	Myers	93,203
Croxton	10,491	Onandaga	63,798
Cyprus	81,178	Pearce	35,343
Dale	1,002,292	Pearson	75,696
Elba	165,055	Penobscot	189
Elizabeth	36,268	Perkins	44,933
Euclid	56,796	Pettit	129,776
Fayal	434,364	Platt	12,382
Fowler	85,506	Ruddy	5,660
Franklin	66,351	Sauntry-Alpena	1,057,819
Genoa	923,477	Schley	120,365
Glen	113,512	Sellers	87,275
Grant	350,475	Shenango	732,978
Hanna	26,252	Sliver	167,225
Harold	281,293	Spruce	638,180
Hawkins	239,965	Stevenson	500,323
Hector (Hale)	20,624	Susquehanna	147,741
Higgins	250	Uno North.	479,315
Hill	1,550,568	Uno South.	266,390
Holman	779,889	Utica	100,123
Hudson	67,278	Victoria	43,557
Hull-Rust	496,977	Virginia Group	648,588
Iroquois	43,313	Virginia (P., M. & Co.)	97,667
Kellogg	113,038	Wacootah	7,835
Kinney	455,836	Webb	20,237
La Belle	14,743	Whiteside	130,198
Larkin (Tesora)	2,668	Williams (N. Cinci.)	11,250
La Rue	30,141	Winifred	52,385
Laura	238,824		
Leetonia	353,063		
Total			22,093,532

GOGEBIC RANGE.

Anvil	310	Montreal	153,122
Ashland	151,478	Newport	560,760
Asteroid	20,570	Norrie Group	883,910
Brotherton	65,015	Ottawa (Odanah)	44,643
Cary	120,017	Pence	26,870
Castile	23,598	Sunday Lake	56,096
Colby	41,633	Tilden	138,387
Eureka	98,609	Yale	154,944
Ironton	63,359		
Total			2,603,318

MENOMINEE RANGE.

Antoine (Clifford)	74,138	Groveland	31,907
Aragon	201,187	Hemlock	107,752
Armenia	51,863	Hiawatha	116,736
Baker	3,290	Hollister	5,021
Baltic	66,502	James	50,439
Berkshire	22,273	Loretto	18,655
Bristol (Claire)	322,647	Mansfield	54,646
Caspian	165,663	McDonald	5,240
Chapin	357,598	Millie	17,040
Chatham	58,056	Munro	9,303
Chicagon	108,947	Penn. Iron Mining Co.	377,026
Crystal Falls	710	Pewabic	352,608
Davidson	45,434	Riverton Group	198,589
Dunn	232,093	Tobin	308,457
Florence	95,266	Tully	8,324
Fogarty	67,616	Vivian	5,971
Genesee (Ethel)	25,342	Wickwire	1,919
Gibson	57,100	Youngs	89,451
Great West'n	84,339	Zimmerman	112,029
Total			3,911,174

MARQUETTE RANGE.

American (Sterling)	194,979	Maas	24,927
Austin	105,078	Mary Charlotte	343,434
Beaufort (Ohio)	2,684	Milwaukee-Davis	7,781
Breitung Hematite	139,582	Negaunee	140,406
Cambria	90,316	Princeton (Swanzey)	27,962
Cleve. Cliffs Group	344,950	Queen Group	297,675
Empire	17,117	Republic	113,012
Gwynn	197	Richmond	47,586
Imperial	84,843	Rolling Mill	96,585
Jackson	52,615	Star West (Wheat)	4,466
Lake Angeline	188,645	Stegmiller	45,122
Lake Superior	174,959	Stephenson	128,839
Lillie	844	Volunteer	51,240
Lloyd	28,003	Washington	62,592
Lucy (McComber)	16,677		
Total			2,833,116

VERMILLION RANGE.

Chandler	50,206	Sibley	1,899
Pioneer	430,919	Soudan	65,349
Savoy	87,964	Zenith	448,295
Section 30	34,298		
Total	1,388,930		

CUYUNA RANGE.

Kennedy	147,431

MISCELLANEOUS.

Iron Ridge	17,032	Mayville	98,627
Total			115,629
Grand total			32,793,130

MINES NOT PRODUCING SINCE 1907

GOGEBIC RANGE.

Bessemer	20,889	Jack Pot	99,090
Blue Jacket	1,799	Meteor (Comet)	216,367
Chicago	68,727	Palms	1,284,489
Davis (Wis.)	103,961	Shores	55,808
Federal	36,443	Sparta	4,862
First Nat'l	1,997	Trimble	25,931
Geneva	7,108	Tyler's Forks	10,683
Hennepin	259,733	Upson	11,375
Iron Chief	12,199	Valley	1,878
Iron Chief No. 2	551		
Total	2,223,890		

MESABI RANGE.

Ajax (Kanawha)	207,650	Holland	270,864
Auburn	2,143,028	Longyear	121,391
Canton	713,048	Mayas	220,765
Cass	241,343	Scranton	1,168
Columbia	16,987	Sharon	329,535
Day	319,453	Sparta	1,244,197
Diamond	171	St. Clair	94,688
Frantz	145,069	St. Paul	137,430
Hobart	8,314	Stephens	454,819
Total	6,669,920		

MARQUETTE RANGE.

Ames	6,298	N. Republic	289
Bay State	16,637	N. Y. Hematite	37,587
Bessie	59,097	New York (York)	1,123,071
Boston	62,542	Northwest	1,687
Braastad (Mitchell)	136,736	Nonpareil (St. Law)	23,395
Braastad (Winthrop)	831,445	Norwood	5,753
Chicago	9,012	Ogden	986
Columbia (Klomin)	94,813	Palmer	14,172
Curry	16,671	Pascoe	59,806
Detroit	140,841	Pendill	45,993
Dexter	118,512	Phenix (Dalliba)	59,114
Dey	2,709	Pioneer	15,409
East Champ'n	76,002	Platt	73,844
East N. Y.	327,604	Primrose	6,040
Edison	893	Quartz	491
Erie	8,136	Republic Reduc. Co.	47,174
Etna	1,091	Richards	8,261
Fitch	31,817	Riverside	16,160
Foxdale	31,447	Saginaw	451,424
Goodrich	49,754	Samson (Argyle)	267,805
Hortense (Nth. Cham.)	30,574	Schadt	1,261
Humboldt	723,961	Section 12	21,887
Iron Mount.	393	Spurr	164,244
Magnetic (stack pile)	292	Taylor	32,970
Manganese	6,359	Titan	90,371
Michigamme	880,362	Webster	34,905
Mesabi's Friend	16,043	W. Republic	133,077
Moore	68,131	Wetmore	50,870
National	150,216	Wheeling	10,552
Negaunee Con. Wks.	12,708	Winthrop	1,912,022
Total	8,621,716		

MENOMINEE RANGE.

Alpha	1,370	Keel Ridge	93,101
Beta	4,211	Kimball	16,224
Breen	75,425	Lee Peck (Cherry Valley Ore)	2,844
Brier Hill	14,981	Manganate	6,844
Columbia	942,703		
Cornell	49,302		

Cuff	58,419	Mastodon	425,708
Delphic	33,770	Metropolitan	107,027
Eleanor (Appleton)	18,719	Monongahela	9,310
Emmett	66,585	Northwestern	35,810
Fairbanks (P't. R.)	379,789	Perry	3,138
Forest	11,988	Selden	2,092
Half and Half	7,524	Sheridan	116,299
Hamilton (Ore Co.)	96,072	South Mastodon	8,203
Hersel	955	Stephenson	39,350
Hilltop	27,229	Sturgeon River	19,404
Hope	28,530	Verona	130,975
Indiana	17,871	Youngstown	151,425
Total	2,996,197		

Some Explanations

Mountain Iron was formerly shown as Mountain Iron (Aetna); Spruce as Spruce (Cloquet); Winifred as Winifred (Day); Puritan as Puritan (Ruby); Chapin as Chapin (Ludington); Soudan as Soudan (Minnesota); Winthrop as Winthrop (Marquette); the Riverton group as Dober (Riverton), and the Queen group as Queen (Blue).

The Antoine (Clifford) was formerly known as the Traders.

The Chatham mine report includes the Brule.

The Commonwealth mine report includes the Buckeye.

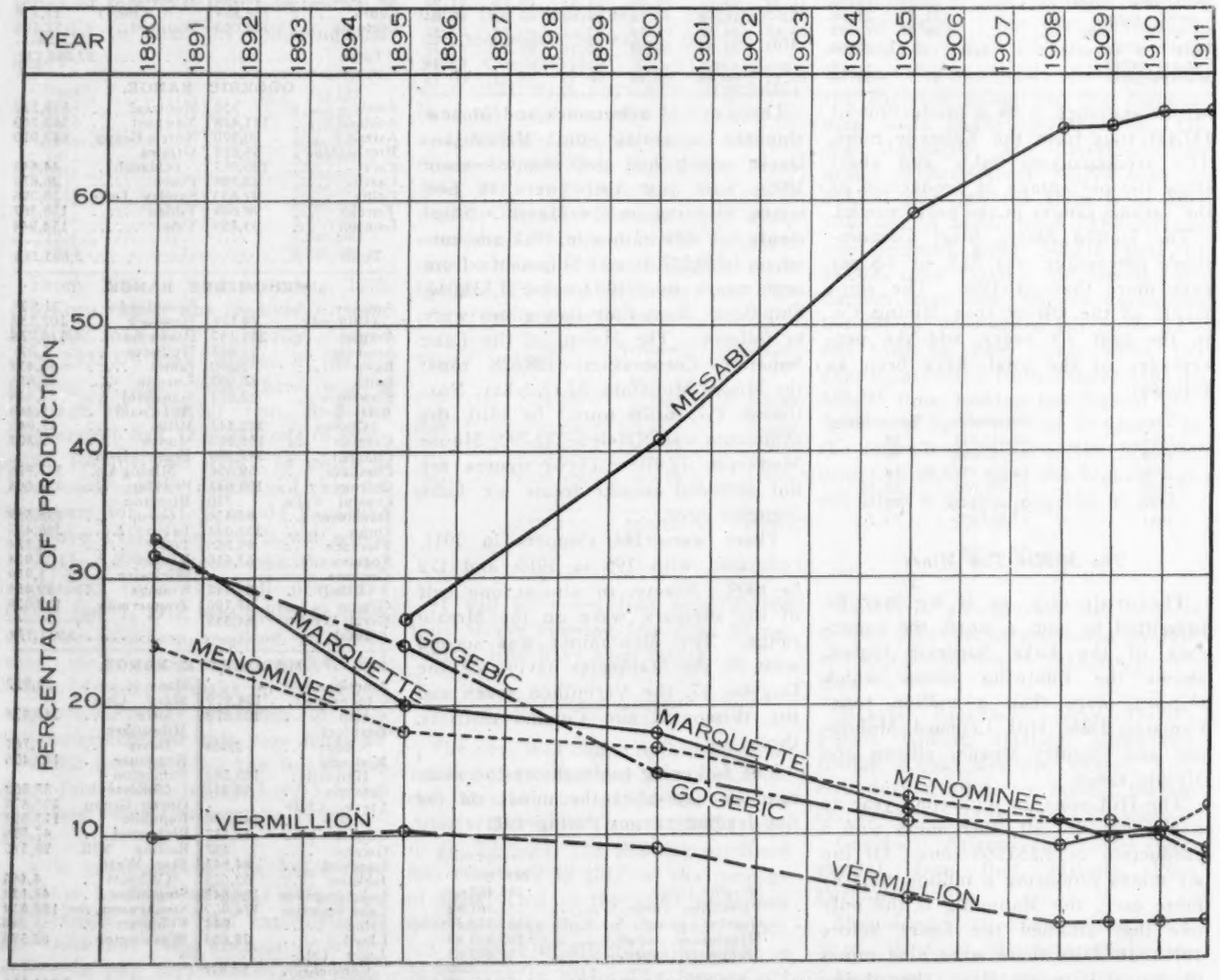
The James (known also as Osana) mine report includes the Wauseca.

The Burt mine report includes the Pool.

The Canisteo mine report includes the Walker.

The Sauntry-Alpena mine report includes the Fay.

The Virginia Group report includes Missabe Mountain and Norman.



PERCENTAGE OF OUTPUT OF THE VARIOUS RANGES, 1890-1911

The Washington was formerly known as the Barron.

The reports of the Burt and Hull-Rust mines include shipments formerly credited to the Lake Superior group. The Missabe Mountain report shown in the 1911 table has been added to the Virginia group statement.

The Milwaukee-Davis mine comprises the old Milwaukee and Grand Rapids (Davis) mines, neither of which had shipped since 1896.

SHIPMENTS BY RANGES, GROSS TONS.

	1911.	1910.	1909.	1908.	1907.	1906.
Marquette range	2,833,116	4,392,726	4,256,172	2,414,632	4,388,073	4,057,187
Menominee range	3,911,174	4,237,738	4,875,385	2,679,156	4,964,728	5,109,088
Gogebic range	2,603,318	4,315,314	4,088,057	2,699,856	3,637,102	3,643,514
Vermillion range	1,088,930	1,203,177	1,108,215	841,544	1,685,267	1,792,355
Mesabi range	22,093,532	29,201,760	28,176,281	17,257,350	27,495,708	23,819,029
Cuyuna range	147,431	.....	.....	.....	.....	.....
Miscellaneous	115,629	91,682	82,759	122,449	95,790	144,589
Total	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668	38,565,762

SHIPMENTS BY PORTS AND ALL-RAIL, GROSS TONS.

	1911.	1910.	1909.	1908.	1907.	1906
Escanaba	4,278,445	4,949,726	5,747,801	3,351,502	5,761,988	5,851,050
Marquette	2,200,380	3,248,516	2,909,451	1,487,487	3,013,826	2,791,033
Ashland	2,429,290	4,094,374	3,834,207	2,513,670	3,436,867	3,388,106
Two Harbors	6,367,537	8,271,177	9,181,132	5,702,237	8,188,906	8,180,125
Superior	9,920,490	8,414,799	6,540,505	3,564,030	7,440,386	6,083,057
Duluth	6,934,269	13,640,166	13,470,503	8,808,168	13,448,736	11,220,218
Total by lake	32,130,411	42,618,758	41,683,599	25,427,094	41,290,709	37,513,589
Total by rail	662,719	823,639	903,270	587,893	975,959	1,052,173
Total	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668	38,565,762

OUTPUT LARGER

In February at Steelton Than This Time Last Year.

Steelton, Pa., March 5.—Showing an increase in business over 1911, the Pennsylvania Steel Co.'s works here for the month of February indicates a considerably larger output of the entire plant in excess of the corresponding month last year. The output of the rail mill alone is several thousand tons greater than for February, 1911, the mill is behind with its orders and new orders are being booked. All indications point to a busy summer for all departments of the Steelton works.

The foundries here are working to full capacity and during the past week recorded a heavy output. The steel foundry is devoting its time to heavy castings for Panama canal work. The machine department is much busier than it was two weeks ago and has considerable new work and some repairs on hand.

Directorates of the John Deere Plow Co., with head offices in Moline, Ill., have been increased in Indianapolis, Syracuse and San Francisco from five to nine members.

Wanders Very Far From Accountant's Field

Discussing Many Matters of Principle and Policy—McRae Disputes Accuracy of Steel Corporation Reports of Earnings

The Stanley investigating committee listened last week to the report of Farquhar J. McRae, expert accountant of the committee, upon the earnings of the United States Steel Corporation.

The report is divided into three sections. Section one deals with the earnings of the Corporation since its formation; section two deals with exhibits submitted by the Corporation; section three, a summary of all the evidence extracted from the minute books and from testimony taken by the committee.

The report shows total gross sales and earnings of all companies combined for the nine years ended Dec. 31, 1910, amounted to $5,424,631,946.14, of which the sales to outside customers amounted to $3,569,629,995.97, and the sales to subsidiary companies amounted to $1,418,988,132.78. Net earnings for the same period amounted to $905,039,607.77. The net operating charges amounted to $4,087,667,271.90, in which amount the Corporation has included charges for ordinary maintenance and repairs amounting to $252,178,582.34, and in addition has set aside for depreciation and replacement the sum of $211,613,964.17.

Out of the total dividends received by the United States Steel Corporation from its subsidiary companies, plus the interest on the Carnegie bonds, making a total of $753,124,386.53 for the period of nine years and nine months, the income from the Carnegie company in dividends and bond interest amounted to $305,239,537.49, or about 40 per cent of the total. The American Bridge Co. paid the holding company dividends on its preferred stock during this period to the amount of $19,715,577.50, or 26 per cent of the total. The condensed statement of the dividends paid by the subsidiary companies of the United States Steel Corporation and the interest paid by the Carnegie company on its collateral trust bonds from April 1, 1901, to April 1, 1910, is as follows:

TABLE A.

Carnegie Co.	$227,280,000.00
Federal Steel Co. com.	114,816,182.00
Federal Steel Co., pf.	31,157,128.50
National Tube Co. com.	29,783,905.50
National Tube Co. pf.	25,299,737.50
American Steel & Wire Co. of New Jersey com.	51,110,460.25
American Steel & Wire Co. of New Jersey pf.	27,299,158.25
National Steel Co. com.	6,400,000.00
National Steel Co. pf.	3,779,153.00
American Tin Plate Co. com.	7,419,600.00
American Tin Plate Co. pf.	3,634,372.00
American Sheet Steel Co. com.	3,184,948.00
American Sheet Steel Co. pf.	5,573,568.00
American Steel & Tin Plate Co. com.	25,540,833.00
American Steel & Tin Plate Co. pf.	12,004,804.00
American Steel Hoop Co. com.	1,330,000.00
American Steel Hoop Co. pf.	2,041,497.51
American Bridge Co. pf.	19,715,577.50
Oliver Iron Mining Co.	2,400,000.00
Lake Superior Con. Iron Mining Co.	66,689,969.03
Shelby Steel Tube Co. pf.	2,221,995.00
Pittsburgh Steamship Co.	243,870.00
Claiton Steel Co.	4,235,000.00
Total	$675,164,849.04
Interest on the Carnegie Co. col. trust bonds	77,959,537.49
Grand total	$753,124,386.53

The report opens with the gross sales and earnings of the Corporation since its formation and shows the proportion of dividends paid by each company. An effort is made to show that the chief profit came from raw material and semi-finished products, and small profits from finished articles, thus keeping raw materials and pig iron on a high plane to the disadvantage of independent interests. The report on production and distribution of profit is as follows:

"During the nine years from Jan. 1, 1902, to Dec. 31, 1910, the production of the Corporation in rolled and other finished steel amounted to 79,267,363 tons, and the adjusted net earnings for the same period, nine years, amounted to $1,029,685,389.28, or an equivalent of approximately $13 per ton. In order that an idea may

be had of the net earnings in dollars per ton of the several operating groups of the Corporation, I have calculated these figures, and I find the approximate net earnings of $13 per ton of finished product to have been earned as follows:

	Per ton.	Per cent.
Earned by manufacturing companies	8.01	61.63
Earned by coal and coke companies	.70	5.42
Earned by iron mining companies	2.12	16.29
Earned by transportation companies	1.81	13.92
Earned by miscellaneous companies	.36	2.74

"Taking the adjusted net earnings for the nine years ended Dec. 31, 1910, at $1,029,685,389.28, it will be found that the percentage of net earnings to sales to outside customers for the period amount approximately to 29 per cent. Twenty-nine per cent on selling price is equivalent to 40 per cent on cost."

Discrepancy Noted

There is a discrepancy of roundly $129,000,000 between the Corporation's statement of earnings and MacRae's statement. Upon this point MacRae says:

"The total net earnings for the entire period from April 1, 1901, to Dec. 31, 1910, as shown by the United States Steel Corporation, amount to $980,000,311.98. Included in the operating charges before arriving at net earnings the Corporation has figured consistently each year certain amounts which, in my opinion, should not have been charged against net earnings and which items I have restored to net earnings for the purpose of these accounts. In other words I have adjusted the net earnings as shown by the Corporation from $980,000,311.98 to $1,109,146,593.49. These include interest on bonds of subsidiary companies, the locked up inter-company profits in inventories, special depreciation, admittedly charged to construction, employes' bonus funds, and special compensations, account preferred stock subscriptions, which have been treated as dividends from earnings and not in the nature of additional wages to employes, and lastly, interest on bonds, mortgages and purchase money obligations of subsidiary obligations."

This, MacRae says, agrees with Judge Gary's method of determining profits as set forth in the tariff hearings as follows:

"In determining the profits since the company was organized I take the amount paid as interest on bonds, the amount paid as dividends on stock and the amount expended for new property and the amount carried forward to surplus."

MacRae, however, adds profit sharing bonus funds to earnings.

Filbert Puzzled

Comptroller W. J. Filbert, of the Steel Corporation, who attended the hearing was extremely puzzled over the entry of $15,401,519.45. He admitted that the item of $65,443,782.06 should be restored to net earnings to arrive at a basis of profits in the total capitalization of stock and bonds but he could not place the $15,000,000 account and could not imagine what it was unless it should be inter-company interest, in which event it would be cared for elsewhere.

MacRae and Mr. Filbert will trace this item together and report later to the committee.

Continuing his testimony MacRae says:

"In addition to the amount spent for new construction, etc., the Corporation has charged in its accounts against the net earnings for the period nine years and nine months, ended Dec. 31, 1910, the following items:

"For ordinary maintenance and repairs from Jan. 1, 1902, to Dec. 31, 1910, $252,178,582.34.

"For nine months, Jan. 1, 1901, to Dec. 31, 1901, estimated, $14,000,000. Total, $266,178,582.34.

Has No Opinion

"The Corporation has also expended under the heading of depreciation, extinguishment, replacement fund and bond sinking funds on its subsidiary companies for the nine years and nine months ended Dec. 31, 1910, an aggregate amount of $213,192,140.78.

"I have not tried to determine or to express an opinion as to whether the amount thus set aside for depreciation, $213,192,140.78, is excessive or inadequate. If it should be determined by competent authorities that either a part or the whole of this amount is not a proper charge against earnings then it should be added to the adjusted earnings ($1,109,146,593.49) increasing the latter amount by either the whole or any part thereof which is thought proper.

Carnegie's Testimony

"This statement is called forth by the testimony of Andrew Carnegie before the ways and means committee in the tariff hearing in which he stated:

" 'Steel mills and furnaces do not depreciate. They cannot be allowed to do so. They must be kept up to the highest standard and improvements introduced when repairs are needed. The statement above (referring to the annual report for 1907 of the United States Steel Corporation) shows that ordinary repairs and maintenance were deducted before profits of $160,000,000 were declared. The mills in the future, properly maintained, as they must be, in order to run safely and well, will be more valuable than they are today.'

"If therefore the amount allowed for ordinary maintenance and repair as above stated of $252,178,582.34 in accordance with Mr. Carnegie's testimony is sufficient to keep the plants whole, then the amount of $213,192,140.78 would increase the adjusted earnings of $1,109,146,593.49 to that extent. The amount of $213,192,140.78 includes $15,401,519.45 of interest on bonds of subsidiary companies, which I have included in my statement of earnings, and, therefore, the amount subject to the above statement would be $197,790,623.33.

"If it should be determined that

Protection for Corporation Employes

Better protection against accidents is given to its employes by the United States Steel Corporation than any other large industrial interest in the United States, according to Dr. Wm. H. Tolman, director of the American Museum of Safety, New York City, addressing the New York Chemical Society at Rumford Hall, New York City, Feb. 10.

"Safety to its employes has become a passion with the United States Steel Corporation," he said. "Wherever it is possible to install a safety device to do away with danger, it is done, regardless of expense. If I were a laborer, I would rather work for the United States Steel Corporation than for any other company in America—that is, of course, so far as personal safety is concerned. The United States Steel Corporation in three years has accomplished in the field of accident prevention a work which took manufacturers in Germany 25 years to accomplish."

Fifty per cent of industrial accidents now occurring are preventable by safety devices, he declared. A Chemical Section of the American Museum of Safety will probably be organized soon.

the above amount of $197,790,623.33 is not a proper charge against earnings (or if a proper amount for depreciation has already been charged to and included in the heading of ordinary maintenance and repairs, which amounts to $266,178,582.34) then the adjusted earnings would amount to $1,306,937,716.82, which would be equivalent to 36.6 per cent in the sales to outsiders of $3,569,629,995.97, which is equal to 57.7 per cent on cost."

Restraint of Trade

On the subject of restraint of trade the report says:

"A number of agreements in restraint of trade existed between subsidiary companies and independent companies at the time of the organization of the United States Steel Corporation, which were continued until 1904, and other agreements were entered into July, 1908, and continued until 1909. It was also testified that although the operation of some of the agreements was terminated in 1904, that the meetings were continued and information was exchanged until 1908. It is now claimed that all of these agreements are discontinued and the only relation that the United States Steel Corporation has with the so-called independent companies is that which may exist because of the Gary dinners. The first Gary dinner was held in November, 1907. It is admitted that the price of at least one commodity, standard rails, has remained fixed, notwithstanding the termination of the pool agreements—and the prices of other commodities—to an extent to be determined hereafter—have been influenced by the interchanges at the Gary dinner. The legal effect of the transition from the system of written contracts with penalties or secret meetings for interchange of data as to the output and prices to the system of Gary dinners should be considered.

"Several of the pooling agreements were rendered unnecessary by the concentration of control of the several subsidiary companies in the United States Steel Corporation. For example, it was no longer necessary for the American Steel Hoop Co. to pay the Illinois Steel Co. $150,000 a year to stay out of the cotton tie business (minutes, directors of the Carnegie Steel Co., July 30, 1901), nor was it necessary for the Carnegie company to keep out of the bridge business unless the American Bridge Co. failed to make two-thirds of the bridge work in the United States (minutes, directors Carnegie Steel Co., April 23, 1900; minutes, directors, American Bridge Co., of New Jersey, May 10, 1900) any more than it was necessary to pay $5,000 a month to the New Jersey Steel & Iron Co., not to operate certain of its structural plants as provided in the Structural Steel Association agreement, because as the holding company controlled all the companies just named, it was necessary to continue these restraining agreements.

"The policy of discontinuing such methods of controlling otherwise apparently independent concerns was followed in other cases. For example, the Carnegie Steel Co., in June, 1909, as appears by the minutes of directors of the company, recommended the sale of 675 shares of the stock of 18 small ginning companies, which had been bought for $19,050 and which were marked down to $8,651.25, it being said: 'As the purposes for which they were taken have now been accomplished, as evidenced by the fact that the shipment of cotton ties this year amounts to about 2,500,000 bundles, we may as well sell them. These are stocks of companies which favor square bales of cotton and use our cotton ties exclusively.'

The Gary Dinners

"In relation to the Gary dinners, Mr. Gary, when asked about the statement made at one of the dinners, that,

'We come together upon a platform that involves the honor of a man which is far better and far higher and far more binding upon us than any contract which we could make,'

testified that it would be dishonorable conduct for a man to sell goods at a different price from that which he told others in the business he was selling at.

"The statement that those at the dinner 'come together upon a platform that involves the honor of a man which is far better and far higher and far more binding upon us than any contract which we could make'' is of practical importance in estimating the effect of the change from the system of written contracts to the system of meeting at the Gary dinners.

"The Gary dinner arrangement, whereat the so-called independents are influenced to reduce their productions conformably to their estimate of the reduction in the demand existing, and to maintain prices, is objectionable as far as it operates to exclude free competition. The arrangement is designed and intended to operate and has operated admittedly as to standard steel rails, although it is claimed that the so-called independent participants can cut prices without fear of penalty, except the dishonor of declaring in favor of a named price and then selling it at some other price.

"What determines the legality or illegality of the arrangement with reference to the anti-trust act is not its possibility of or liability to a fracture; but what can be and is done under it. It seems that there has been sufficient performance of the subject of the 'meetings of the minds' at the Gary dinners to prove that as far as it is carried out by the combination, it must interfere with one participant competing with another, even though disaffected and ill-advised participants might isolatedly violate their pledges."

Export Trade

The great export trade that the United States Steel Corporation has built up is touched upon in this manner:

"By the resolution that subsidiary companies of the United States Steel Corporation shall refuse to handle orders for export business and that such orders must be turned over to the United States Steel Products Co., the subsidiary companies preclude themselves from competing for export sales against the export company, and by the resolutions to give lower prices to the export company and allowing it a percentage for expenses the competition of export sellers, other than the export company, seems to be entirely prevented as the United States Steel Corporation itself in its answer claims that it now controls 90 per cent of the total export trade of the United States in steel products.

"The result of enforcing these resolutions and arrangements is that materials for export must be bought from the United States Steel Products Co. and buyers in the United States, who wish to buy goods for export, are compelled to pay an additional profit to the United States Steel Products Co.

"If it be suggested that the subsidiary companies which sell to the United States Steel Products Co. reduce the profit in favor of the export company no reason is seen why the reduction cannot be made to any buyer for direct export, except the arrangement between the companies."

It is stated in the report that the compensation or profit accruing to J. P. Morgan & Co. for acquiring the subsidiary companies and organizing the Corporation were $130,000,000, half in preferred and half in common, from which would have to be deducted cost advances amounting to $28,000,000.

The Otis Steel Co.'s New Plant at Cleveland

A Complete Iron and Steel-Making Unit to Include Three Blast Furnaces, Twelve Open-Hearths, Rolling Mills, Etc.

As outlined at present, the plans for the new plant of the Otis Steel Co., Cleveland, provide for a complete iron and steel-making unit, consisting of blast furnaces, steel works and rolling mills. An effort is being made to obtain municipal and governmental consent for filling in the lake front of the Otis Steel Co.'s property for a distance varying from 1,100 to 1,500 feet from the Lake Erie shore line. The made land would extend to the 2,000-foot line established by the war department inside of east breakwater, which is provided as a channel for boats entering the Cleveland harbor.

At a recent public hearing it was announced that a ruling on this project could be expected from the United States attorney general within a few weeks and until that time definite action has been deferred. It is doubtful whether the municipal authorities will interpose further objection provided a public highway of some kind is provided through the property. It was at first intended to insist upon a channel between the shore line and the site upon which the new plant is to be built, but it was finally concluded that, owing to the difficulties that would be involved in operating a plant of this kind on an island, that this suggestion would hardly be feasible. The made land will cover an area of approximately 60 acres.

The plan of the plant and the arrangements of the various departments are shown in the accompanying illustration. The new works are to be built on made land north of the tracks of the Lake Shore & Michigan Southern railroad, south of which the Otis Steel Co.'s present plant is located. As arranged, ore carriers will be unloaded at a dock adjoining the ore yard. This yard is to be 1,250 feet long and 225 feet wide. Three blast furnaces will be built which will have a capacity of from 400 to 500 tons each per day, and two pig-casting machines will be installed for Sunday metal and for iron in excess of the open-hearth requirements. Adjoining the blast furnace plant and practically parallel thereto will be built the boiler house and power plant. The former will be 340 x 42 feet and will contain 16 boilers, while the power house will be 180 x 65 feet. Twelve open-hearth furnaces are to be built and while the size of these units has not yet been definitely determined, they will be of the large, modern type and probably of 60 tons capacity each. The plans provide for the installation of 48 gas producers and between the gas producer plant and the open-hearth furnaces will be located a scrap yard, 1,050 feet long and 85 feet wide. A mixer will also be installed at one end of the open-hearth furnace plant.

After the ingots are cast in the open-hearth furnace department they will be delivered to the ingot stripper in the soaking pit building, which will be built at one end of the rolling department. Four soaking pits have been arranged for in the preliminary plans, but additional pits will be built if necessary. The rolling equipment will consist of a blooming mill of ample size to handle practically the entire tonnage of the plant and the steel will be rolled into merchantable forms in a continuous mill. While the capacity of this mill has not yet been determined, it is probable that it will be equipped to roll billets, sheet bars, large sizes of merchant bars, etc. A bloom and slab yard will adjoin the blooming mill building and the soaking pits will be provided with gas from eight producers. The boiler house for the rolling department will be 50 x 360 feet and will contain 16 boilers. Provisions have also been made for the erection of a two-story office building which will contain a laboratory; a two-story blacksmith and boiler shop and the carpenter and pattern shops and pattern storage will be located in another two-story building. A large machine shop also will be built and a locomotive house will be provided.

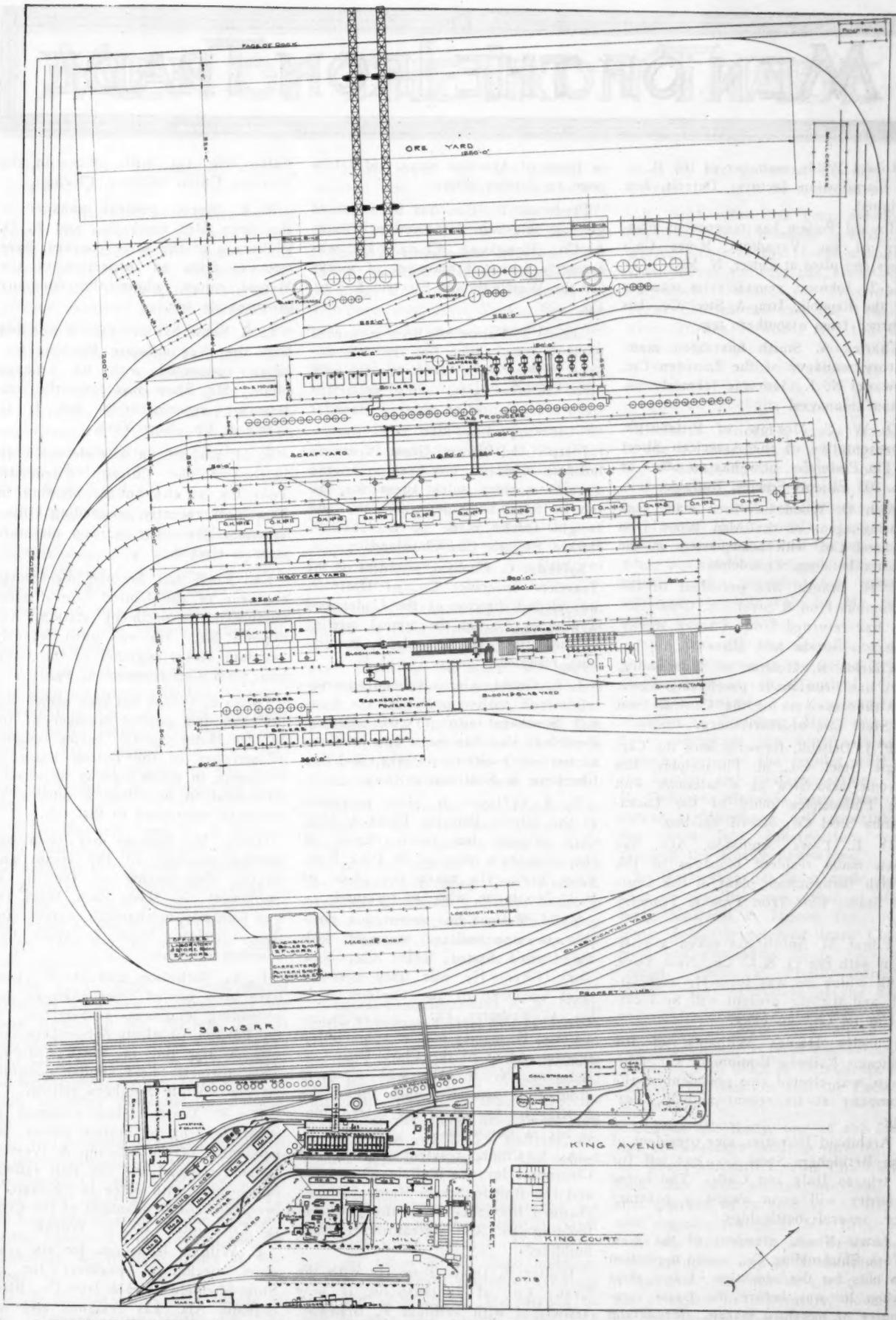
The Present Plant

A section of the plant of the Otis Steel Co. is shown south of the tracks of the Lake Shore & Michigan Southern railroad, in the accompanying illustration. The product consists of steel ingots, castings, plates, bar steel and forgings, and the annual capacity is estimated at 20,000 tons of acid open-hearth ingots, 90,000 tons of basic open-hearth ingots and 20,000 tons of open-hearth steel castings. Unless a definite decision is obtained in the near future it is probable that the Otis Steel Co. will be compelled to seek another site, although the lake front project is preferred, as it will permit of the operation of the existing and new plants as one unit. The plans for the new works were prepared by Arthur G. McKee, consulting engineer, Rockefeller building, Cleveland.

The Union Drawn Steel Co.

To facilitate the distribution of its extensive line of bright finished steel products, the Union Drawn Steel Co., Beaver Falls, Pa., has built several warehouses in the leading iron and steel consuming centers. The first warehouse was erected in New York City on a plot of ground 100 x 125 feet, at Washington, Watts and Canal streets. The Philadelphia warehouse, Ninth and Willow streets, covers an area of 82 x 120 feet and a year ago a warehouse was completed in Chicago at 564 to 570 West Monroe street, which is 60 x 150 feet. The company also has a warehouse in Cincinnati. The stock of material is limited to bright finished steel products exclusively, including shafting, screw stock, rounds, flats, squares, hexagons, shapes, etc. The Union Drawn Steel Co. was organized May 6, 1889, and at the present time the company operates one of the largest bright finished steel plants in the world. Two works are located at Beaver Falls, the larger one of the two having been built during the last two years. The building is of fireproof construction throughout and is equipped with modern machinery. This plant replaces the old works destroyed by fire. A Canadian company also has been organized and a plant has been established at Hamilton, Ont., to meet the requirements of the Canadian trade. This plant is owned by the stockholders of the Union Drawn Steel Co. The various works and warehouses represent an investment of approximately $2,000,000, although the Union Drawn Steel Co. is capitalized at only $1,500,000. F. N. Beegle is president of the Union Drawn Steel Co., and Frederick Davidson, secretary and treasurer.

The Illinois Car & Mfg. Co., Chicago, has increased its capital stock from $100,000 to $175,000.



PLAN OF THE NEW PLANT OF THE OTIS STEEL CO., CLEVELAND; SOUTH OF THE TRACKS OF THE L. S. & M. S. RAILROAD IS SHOWN A PART OF THE COMPANY'S PRESENT WORKS

MEN OF THE IRON TRADE

Robert Wilde, manager of the R. C. H. Corporation factory, Detroit, has resigned.

Howard Poillon has resigned as manager of the Vanadium Mines Co.'s mines and plant at Cutter, N. M.

C. T. Johnson, general sales manager for the Republic Iron & Steel Co., has returned from a southern trip.

Charles A. Smith has been made factory manager of the Lansden Co., Newark, N. J. He was formerly assistant manager.

D. W. C. Morrow, of Pittsburgh, representative of the American Sheet & Tin Plate Co., now has an office at No. 203 Ellicott Square, Buffalo.

Alan D. Wood has been made purchasing agent of the Alan Wood Iron & Steel Co., with headquarters in the Morris building, Philadelphia.

J. H. Frantz, vice president of the Columbus Iron & Steel Co., Columbus, O., has returned from a three weeks' trip to Florida and Havana.

Charles R. Holton, of Harrisburg, Pa., has been made purchasing agent for the receivers of the Central Iron & Steel Co., of Harrisburg.

P. J. Driscoll, formerly with the Carnegie Steel Co., at Philadelphia, has become associated as a salesman with the Philadelphia office of the Lackawanna Steel Co., Morris building.

D. E. Laws, Anniston, Ala., has been made resident manager of the North Birmingham plant of the United States Cast Iron Pipe & Foundry Co.

Edgar M. Smith has taken a position with the Q. & C. Co., New York, with which he was formerly associated, and for the present will be located at its Chicago office.

Charles Haines Williams, of the Chicago Railway Equipment Co., Chicago, was elected vice president of the company at its recent annual meeting.

Archibald Johnston, vice president of the Bethlehem Steel Co., has left for a trip to Italy and Chile. The latter country will soon award a contract for several battleships.

Lewis Nixon, president of the New York Shipbuilding Co., voiced opposition to bills for the admission of free ships when he was before the house committee of merchant marine. Mr. Nixon urged a return to discriminating duties in favor of American ships and a tonnage on foreign ships.

Frederick W. Cox has been named general salesman for Shewan, Tomes & Co., Hongkong, China. He was formerly assistant manager of works for the Westinghouse Electric & Mfg. Co.

Samuel T. Fulton has been appointed general sales agent for the Railway Steel Spring Co., New York, with office in that city, being promoted from the position of western manager with office in Chicago.

Joseph M. Brown, Great Northern building, Chicago, has been appointed general western sales agent for the motor-driven baggage, warehouse and freight trucks made by the Elwell-Parker Electric Co., Cleveland.

Sylvester C. Dunham, president of the Travelers' Insurance Co., of Hartford, was elected director of the Underwood Typewriter Co., at the annual meeting of the latter. He succeeds A. R. Erskine, resigned.

J. E. Gould, who has been superintendent of motive power of the Norfolk Southern railroad, with office at Berkeley, Va., has been appointed to a similar position on the Raleigh, Charlotte & Southern railway.

E. J. O'Hayer Jr., vice president of the Miehle Printing Press & Mfg. Co., Chicago, has taken charge of the company's office at 38 Park Row, New York. He takes the place of F. L. Montague, who has resigned.

V. M. Palmer has accepted a position as standardizing engineer with the United States Motor Co., New York City. He was until recently chief engineer of the Sheldon Axle Co., Wilkesbarre, Pa.

Percy H. Squier has been appointed superintendent of the Clark Bros Co., Belmont, N. Y. He was formerly production specialist with the Blake & Knowles branch of the International Steam Pump Co.

A. J. Chinn, resident engineer in Cincinnati for the Buffalo Forge Co. and the Buffalo Steam Pump Co., has changed his office from the Andrews building to 505 Mercantile Library building.

Walter E. Davis, formerly with the Crane Co., at Indianapolis, is now associated with William E. Bradway, western sales manager of the Kennedy Valve Mfg. Co., with offices in the Western Union building, Chicago.

R. C. Steese, general manager of the Brier Hill Steel Co., and F. D. Wilkerson of the same concern, have returned from an inspection of the Mesabi range, where the company procures its ore.

L. S. Shaw has accepted a position with the Westinghouse Machine Co., being connected with its Chicago office. Mr. Shaw was formerly construction superintendent for J. G. White & Co., New York.

E. M. Richardson was elected a director of the Chicago Pneumatic Tool Co. at the annual meeting in New York recently, succeeding Oliver Wrenn. The other retiring directors were re-elected.

Leo Loeb has become mechanical engineer of the United States naval engineering experiment station, Annapolis, Md. He was until recently assistant steam engineer of the Cambria Steel Co., Johnstown, Pa.

Lucius E. Wilson has been named vice president and general manager of the Warren Motor Car Co., having resigned as secretary of the Detroit board of commerce, in which capacity he was instrumental in attracting a number of industrial enterprises to that city.

Harry M. Latham has been appointed manager of the steam and electric departments of the B. F. Sturtevant Co., Hyde Park, Mass. He was formerly mechanical engineer for the American Steel & Wire Co., Worcester, Mass.

F. L. Nicholson and D. W. Lum have been named chief engineer and consulting engineer, respectively, of the Raleigh, Charlotte & Southern railway, a new line in North Carolina. They formerly held similar positions on the Norfolk Southern railway.

H. F. Wardell has resigned as superintendent of motive power and equipment of the Chicago & Western Indiana railroad and the Belt railway of Chicago, with office in Chicago, to become assistant manager of the Central Locomotive & Car Works.

F. William Hausman, for six years chief mechanical engineer for the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has resigned and will engage in mechanical engineering for

MEN OF THE IRON TRADE

himself in the Birmingham district, it is said.

H. F. Wardwell, superintendent of power and equipment of the Chicago, Western Indiana & Belt railway, and formerly assistant to President Delano, of the Wabash, has resigned to become assistant general manager of the Central Locomotive & Car Works.

George W. Brymer, formerly chief engineer of the northeastern division of the Pennsylvania Coal & Coke Co., at Cresson, Pa., and later division superintendent at Patton, Pa., has been appointed superintendent of the Edgewater plant of the Tennessee Coal, Iron & Railroad Co.

Heinrich Koppers, of Essenruhr, Germany, head of the H. Koppers by-product coke and gas oven system, arrived recently in Joliet, Ill., from Germany. This is his first visit to America in two years, the extensive business of the system making his trips infrequent.

William J. Norris, who for 17 years has been identified with the Wheeling Corrugating Co., and who has been its assistant manager of the Chicago branch, has resigned, and after taking a rest will engage in the same line of business in Chicago for himself.

F. W. Boye Jr., and W. T. Emmes have purchased the interest of W. A. Schumacher in the firms of Schumacher & Boye and Schumacher, Boye & Emmes, and have incorporated under the name of the Boye & Emmes Machine Tool Co. to take over these two concerns.

John C. C. Mayo has been elected president of a new company that has been formed at Mt. Sterling, Ky., to manufacture a blue grass seed stripper that has been patented by Oscar Palmer of Bath county, Ky. A factory will be built at either Morehead or Preston, Ky.

J. T. Luscombe has been appointed master mechanic of the Cleveland, Cincinnati, Chicago & St. Louis railroad, with office at Bellefontaine, O. He has been division master mechanic of the Toledo & Ohio Central and the Zanesville & Western roads at Bucyrus, O.

R. T. McCormick, sales manager of the Petroleum Iron Works Co., has tendered his resignation after ten years of service with that company, and C. J. McDowall has been elected to succeed him. Mr. McCormick retires in order to give more time to other interests of a personal nature.

Frank F. Coggin has returned to his former position with the Chicago Car Heating Co., with headquarters at 170 Broadway, New York. For several years he was representative of the company in New England territory and for the past six months has been connected with the Ward Equipment Co., New York.

Emil Durr has been appointed director of publicity of the Hart-Parr Co., Charles City, Ia., manufacturer of gasoline tractors and machinery. He was advertising manager of the National Brake & Electric Co., of Milwaukee, in which position he has been succeeded by A. C. Paul, of Milwaukee.

Barton R. Shover, who recently resigned as chief electrical engineer of the Youngstown district for the Carnegie Steel Co. to accept the superintendency of the proposed steel plant of the Brier Hill Steel Co., Youngstown, O., was banqueted last week by the superintendent and heads of departments of the Ohio works, Youngstown, where he was employed.

Robert C. Cooley has resigned as secretary to President Thomas J. Bray, of the Republic Iron & Steel Co., and has accepted a position with the Standard Welding Co., Cleveland. William Gosewisch, of the Republic sales department, succeeds Mr. Cooley and Thomas Conners succeeds Mr. Gosewisch. The changes were effective March 1.

General Superintendent A. R. Hunt, of the Homestead Steel Works, Homestead, Pa., has announced the following appointments for the Howard axle plant; Samuel C. Wood, superintendent; Frank J. Black, superintendent of the wheel department and B. F. Fence and C. D. Rafferty, assistant superintendents of the wheel department.

Frank Illenberger discontinued his connection with the Colonial Steel Co., Detroit, on March 1. He will retain the office at 517 Ford building, Detroit, and will continue handling tool and alloy steels. He intends to add to this line sheets, plates and other steel commodities along with aluminum, brass and bronze castings made by the Columbia Castings Co., Detroit, of which he is president.

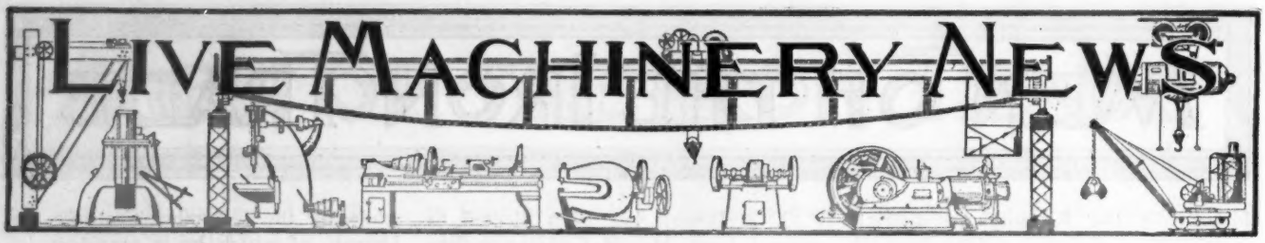
R. A. Crofton has been appointed assistant general manager in charge of motive power of the Houston East & West Texas railway, the Houston & Shreveport railroad, the Houston & Texas Central railroad, the Texas & New Orleans railroad, and the Galveston, Harrisburg & San Antonio railway, with office at Houston. He succeeds J. T. Connor, who has been granted an indefinite leave of absence.

Louis A. Woodard, works manager of the William Tod Co., Youngstown, O., is occupying the position of general manager of that concern, a position made vacant by the resignation of Irving H. Reynolds. Upon the return of directors of the company who are abroad, official action to select a vice president and general manager, the title held by Mr. Reynolds, will be taken.

H. A. Woods, who has been assistant chief engineer of the Grand Trunk Pacific railroad, at Montreal, Que., has been transferred as assistant chief engineer to Winnipeg, Man., and will have charge of the construction of branch lines and the regular work of the eastern and western sections. B. B. Kelliher, who has been chief engineer at Winnipeg, will superintend the main line construction work through the Rocky mountains.

L. H. Mesker has been made manager of the St. Louis office of Manning, Maxwell & Moore, Inc., New York, being transferred from Cleveland, and succeeding C. L. Lyle, resigned. Frank P. Smith, formerly in the sales department of the company, has re-entered that department with office in New York, and C. R. McCullough has entered the sales department with office in Detroit, having resigned his position with the Packard Motor Car Co.

Charles W. Kelly, one of the largest stockholders and a director of the Bruce-Macbeth Engine Co., Cleveland, has been elected president of that concern to succeed W. C. Bruce, who recently resigned. Mr. Bruce retains his interest in the Bruce-Macbeth company and will continue as a director. He will devote most of his attention in the future, however, to the Bowler Foundry Co., Cleveland, of which he has long been president.



In the New York machinery market last week, the most important event was the closing of the list of machine tools submitted last year by the New York, New Haven & Hartford railroad, two large New York houses getting the majority of the business. Small orders were also placed by the New York Central and the Delaware & Hudson companies. The latter road is further expected to make a decision before the end of this month regarding the large list of specifications for its Watervliet, N. Y., shops. New York dealers are now bidding on a list of machine tools for a technical high school at Jersey City, N. J. In Pittsburgh, current inquiries and orders are confined to small lots only; the Westinghouse Machine Co., Pittsburgh, reports, however, that its business booked during February exceeded in volume that of any month during 1911. In Cleveland, the market is quite featureless; inquiries are scarce and orders booked are for small lots. In Chicago, the machine tool trade has quieted down considerably and the volume of such business is very narrow; for the general lines of machinery, however, the demand is fairly good.

Machine Tools

The Decatur Cornice & Roofing Co., of New Decatur, Ala., is asking for quotations on a milling machine to be used in machining cast iron columns.

The Atlanta Utility Works, Box D, East Point, Ga., is in the market for a No. 2 Baker Bros. keyseater in good order.

The Pennsylvania Coal & Coke Corporation is considering plans for increasing the machine shop facilities at Cresson, Pa. No contract has been closed, but estimates are being taken. The company is getting power for operating its mines from an outside power company.

The most important new inquiry now before the New York trade is a list of metal working machinery for the Jersey City industrial technical high school. The list includes about 90 tools, approximating $60,000 in value, and bids will be opened Thursday night, March 7.

The large list of machine tools that was submitted by the New York, New Haven & Hartford railroad last year has been closed. The list included about 50 tools amounting to approximately $60,000 in value. Several New York dealers shared in the awards, but the majority of the business was divided between a large Liberty street house, and a lower Broadway concern. A list of shop equipment amounting to about $12.000 was also placed with the same interests by the New Haven company for the Port Chester division of the system.

Power Plant Equipment

Berlin, Wis., expects to install a municipal electric light plant in connection with its waterworks.

Lynnville, Tenn., has under consideration the question of establishing a lighting plant, and bids will probably be asked for in the near future.

The Indiana Lumber Co., Nashville, Tenn., is reported to be in the market for a boiler. Ralph P. Mattingly is general manager of the company.

Paris, Ky., is considering plans for the expenditure of $50,000 in the establishment of a municipal electric light and power plant.

Hartford City, Ind., expects to install two 100-horsepower water tube boilers, together with accessories, in the city waterworks. J. T. Trant is city clerk.

Falmouth, Ky., will purchase a boiler, engine, generator, etc., for its lighting plant, bids on the construction and equipment of which will close March 11.

The Yadkinville Buggy Co., Yadkinville, N. C., is in the market for power equipment and will purchase an engine and boiler. Second-hand machinery will be given the preference.

The Fulton Electric Light & Power Co., Fulton, Ky., will erect a plant in the near future. The company has been incorporated with $10,000 capital stock by John Howell Hooks, E. B. Wade and others.

Jesse Kirkland, Hardin, Ky., is organizing a company for the establishment of an electric light plant of small capacity. The chief purpose of the plant will be to furnish current for street lighting.

Owensboro, Ky., will probably require some power equipment for its water plant, improvements having been taken under consideration following a report of the national board of fire underwriters indicating that the plant has inadequate facilities.

The city council, Paxton, Ill., is understood to have granted a 30-year franchise for a power plant to the Consumers' Electric Light, Heat & Power Co. Work on the plant is to commence this month and it is to be completed during the summer or fall.

Henderson, Ky., is in the market to purchase a 900-horsepower turbine provided a report of a committee of the city council is approved. The turbine will be a duplicate of one installed two years ago by the Westinghouse company.

The Arkansas Hydro-Electric Power Co., Little Rock, Ark., has been incorporated by H. F. Fix, E. T. Stanfield and W. L. Thomson, to build a concrete dam and electric power station on the Little Red river, near Higden, 55 miles north of Little Rock. The plant is expected to cost $10,000.

The Tippecanoe River Electric Co., Indianapolis, has been incorporated to build an electric power plant on the Tippecanoe river, near Monticello, Ind. The company is capitalized at $300,000 and expects to begin work on the plant within the year. The incorporators are W. D. Jones, J. W. Lilly and A. C. Ayers.

The West Virginia Power Co., with principal offices at Charleston, W. Va., has been chartered for the purpose of building plants in Summers and other counties of that state, for distributing power to manufacturing concerns. The incorporators are: Arthur J. Brady, and E. H. Pitney, 165 Broadway, New York; Fred Auld, Charleston, W. Va., Sumner Ford, Brooklyn, N. Y., and Lester C. Burdette, New York City.

New Construction

The Monarch Metal Mfg. Co., Kansas City, Mo., is considering the erection of a new plant.

The George J. Meyer Mfg. Co.,

Milwaukee, contemplates the erection of a new plant.

The Saurer Motor Co., Plainfield, N. J., is taking bids for a one-story factory building, 83 x 99 feet.

The Cox Brass Mfg., Co., Albany, N. Y., is planning to erect a three-story addition to its brass foundry.

The Defiance Machine Works, Defiance, O., is erecting a one-story addition to its plant, 76 x 132 feet.

The Baltimore Bridge Co., Baltimore, is preparing plans for the construction of a new machine shop.

The De Tamble Motor Works, Anderson, Ind., is erecting a one-story addition to its plant.

The Keystone Stove Foundry, Spring City, Pa., is preparing plans for a two-story pattern shop, 40 x 90 feet.

The Fulton Machine & Vise Co. has had plans prepared for a one-story foundry addition to its plant at Lowville, N. Y.

The Los Angeles Can Co., Los Angeles, Cal., plans to build a new manufacturing plant at an early date. H. Whitaker is head of the company.

The Metzger Motor Car Co., Detroit, is letting contracts for the erection of a four-story manufacturing building, 56 x 328 feet.

The Greenlee Foundry Co., 662 West Twelfth street, Chicago, is about to begin work on a new foundry.

It is reported that the Sherwood Brass Co., operating a brass foundry and finishing department at Detroit, will erect an addition to its plant.

The Wolverine Brass Works has awarded a contract for the building for a new brass foundry on Canal street, Grand Rapids, Mich.

The Sherwood Brass Works, Inc., Detroit, have let the general contract for a substantial brick addition to the present plant.

The Union Steam Pump Co., Battle Creek, Mich., is preparing plans for the construction of a new foundry this spring. Estimated cost, $30,000.

The General Electric Co. recently let a contract for the construction of a new malleable iron foundry at Erie, Pa. L. C. Reynolds is engineer for the company at Erie.

J. E. Korelock, superintendent of the Chattanooga Wire & Iron Works, Chattanooga, Tenn., is preparing to establish a plant for the manufacture of wire novelty goods.

The Warner Elevator Co., Cincinnati, will erect a one-story factory addition, 132 x 283 feet. Bert L. Baldwin & Co., that city, will receive bids.

The Peerless Motor Car Co., Cleveland, is planning to erect some additional buildings and will probably commence work on one of them in about 30 days.

The Louisville & Nashville is planning the construction of repair shops at Winchester, Ky. The chief engineer of the company is located in Louisville.

The Buda Co., 631 Railway Exchange building, Chicago, will start work soon as the weather permits on a core oven department. The building will be 30 x 50 feet.

A. W. Governor, Ft. Wayne, Ind., is reported to have plans in progress for a new tank shop, 80 x 200 feet, to be erected for the Wayne Oil Tank & Pump Co.

The Allyne Brass Foundry Co., Cleveland, has increased its capital stock from $50,000 to $125,000 and will make extensions, including added facilities for the manufacture of plumbing supplies.

The Raleigh Iron Works Co., Raleigh, N. C., is considering the erection of a malleable iron foundry. This company now manufactures gray iron and brass castings and operates large machine and pattern shops.

Bids are being asked for the erection of a one-story, brick, pattern shop for the Meadville Malleable Iron Co., Meadville, Pa. Plans are in the hands of E. J. Weaver, Meadville, the architect in charge.

The McCroskey-Reamer Co. is planning to build a new plant in Washington street, Meadville, Pa., and has purchased three acres to be used for this purpose. The company is now occupying leased quarters at Meadville.

The New York, New Haven & Hartford railroad has completed plans for a two-story, brick shop, 149 x 201 feet, which will be erected in the Van Nest yard on Van Nest and Mathews avenues. The building is estimated to cost $70,000.

A factory building of brick and mill construction, four stories, 64 x 125 feet, will be erected at 2817 South Halsted street, Chicago, by Filmore W. Todd. The building will be equipped with considerable power transmission machinery and elevators.

Plans have been filed in the borough of the Bronx, New York, for a five-story, brick, factory, 52.6 x 96 feet, to be constructed on the east side of Stettins avenue near Freeman street. It will be accupied by the Tremont Iron Works. Estimated cost $50,000.

The Topliff-Ely Co., formerly of Elyria, O., has awarded the general contract for the construction of a new plant at Washington, Pa., to Vestey-Stewart & Russell, of Washington. The building will be 40 x 300 feet, one story high, and is to be completed in 60 days.

The General Engineering Co., Philadelphia, is erecting a large machine shop at Front & Kenilworth streets, that city, to be 120 x 167 feet. The shop is to be equipped with the latest improved types of machinery for ship and engine repairs and for boiler work of all kinds, including both repairs and new construction.

The United States McAdamite Metal Co., Brooklyn, has acquired a site at the corner of Isabella avenue and E street, Detroit, and will add to the present buildings there for a branch factory. Plans call for a brick and steel structure, 90 x 150 feet. McAdamite metal castings will be produced.

The Standard Aluminum Co., Two Rivers, Wis., has increased its capital from $50,000 to $100,000 to provide for extensions of the business and new construction now completed, under way and projected. A two-story manufacturing building, 60 x 300 feet, of brick and steel construction, is now being completed. W. S. Bremer is president and general manager.

The Russell Motor Co., Toronto, has decided to increase its capacity by immediate additions to its buildings and plant and is issuing $400,000 in 7 per cent cumulative preferred shares, for which present stockholders will be allowed to subscribe at par in the proportion of one new share for each four now held. The present capital is $1,600,000.

The Greenville Metal Products Co., Greenville, Pa., has been awarded a contract for automobile parts, covering a term of five years, by the Empire Automobile Co., Indianapolis, Ind., 1,000 equipments to be delivered in 1912, and 2,500 equipments each year thereafter. The company has commenced work, remodeling and enlarging its factory, to take care of this additional business.

Included in the extensions being made to the Hamilton, Ont., plant of the Steel Co. of Canada, are: A new boiler house; rod mill, 83 x 550 feet; bloom and billet mill, 65 x 400 feet; gas producer building, 50 x 400 feet, and other buildings. The total cost is about $140,000. About $200,000 will be spent for new machinery and equipment. The Morgan Construction Co., Worcester, Mass., is the engineer.

Promoters of the proposed new Sheet Steel Co., at Apollo, Pa., state that the new corporation will have a capital of $150,000, and it is proposed to establish a six-mill plant at Apollo,

for steel sheet production. An old foundry site, containing 8½ acres, has been secured and the construction of the plant will be under the direction of Robert Locke, who recently resigned as general manager of the Allegheny Steel Co., Brackenridge, Pa.

The Union Tool Co., Los Angeles, Cal., has decided to increase the plans already outlined for a new $400,000 plant at the new town site of Dominguez, near Los Angeles, and will expend $100,000 in the erection of a barrel factory. Contracts for the work were let in Chicago and some of the steel for the construction is already on the ground. The barrel factory will be 100 x 200 feet and will be of steel and concrete construction. Work on the new plant has already begun and the contract calls for the completion of the plant before June 1. Work on the $400,000 main building has also begun and when completed the two plants will employ more than 800 men.

Miscellaneous

The city of Clay Center, Kas., expects to install a crank and fly-wheel pump of about 1,000,000 gallons daily capacity, sometime this year.

The West Bend Aluminum Co., West Bend, Wis., is ready to award contracts for furnishing and installing a 52,000-pound pressing machine.

The Kentucky River Hardwood Co., Quicksand, Ky., is in the market for two used locomotives, 42-inch gage, for use on its logging railroad in Breathitt county, Ky.

The Valley Smokeless Coal Co. of Johnstown, has added two Baldwin-Westinghouse locomotives, seven shortwall mining machines, an electric hoist, and an electrically driven shaker-screen to the equipment at its mine.

J. H. Cole, South Bend, Ind., has obtained a franchise from the town board of Owensville, Ind., for water works and expects to let a contract for the plant by the middle of this month.

Bruce & Standevin, 432 Bee building, Omaha, Neb., are consulting engineers for a new water works, which will be built at Minatare, Neb. The cost of the system is estimated at $10,000.

Oscar Claussen, city engineer, St. Paul, is completing plans and specifications for additions to the west side pumping station of the waterworks department, to include a new pump and boiler.

Motors, conveying equipment and other machinery will be needed by A. Waller & Co., Henderson, Ky., who are planning the immediate erection of a large grain elevator at Sturgis, Ky.

The Yellow Poplar Lumber Co., Coal Grove, O., is building a railroad into eastern Kentucky, for the purpose of developing a timber tract. The road will be 25 miles long. A number of large sawmills will be erected along the line.

The common council of Horicon, Wis., has voted to proceed with the preparation of plans and specifications for a municipal water works system to cost approximately $45,000. W. G. Kirchoffer, Madison, Wis., is consulting engineer.

Mowbray & Robinson, Cincinnati, will require machinery shortly for their new sawmill at Quicksand, Ky., the fourth that the company has erected for the development of its large oak timber holdings in that part of the state.

The Hopkinsville Water Co., Hopkinsville, Ky., is preparing to let contracts for a large amount of new machinery, including a battery of high-pressure boilers, a large capacity pump and other equipment. The changes are to be made following recommendations of fire underwriters.

The Crucible Coal Co., Pittsburgh, has placed an order for two 300-horsepower, four-valve, Russell engines to be installed at the new Arrensberg works in the Monongahela valley, where the company is opening new coal mines, and has coke ovens in contemplation.

Sales of the following cranes have been made by the Alliance Machine Co., Alliance, O., through the New York office at 42 Broadway: One 100-ton crane to the Bethlehem Steel Co.; one 45-ton crane to the Midvale Steel Co., and two cranes to J. G. Brill & Co.

Government News

Contracts have been awarded by the bureau of supplies and accounts, navy department, for furnishing materials and supplies, to be delivered to the naval stations named, in accordance with the schedules enumerated under bids opened on the days indicated, as follows:

Opening Dec. 12.

Schedule 4073, class 21, Puget Sound, two furnaces, oil burning, crucible, portable, closed, flame tight: Monarch Engineering Co., Baltimore, $649.

Opening Jan. 9.

Schedule 4183, class 32, Philadelphia, 1 fresh water pump, motor driven: Steam Pump Co., New York, $595.

Opening Jan. 23.

Schedule 4226, class 121, Norfolk, 1 surface condenser of 250 square feet cooling surface, with pump: Dean Bros. Steam Pump Works, Indianapolis, $725.

Opening Feb. 13.

Schedule 4288, class 59, Brooklyn, 130 pneumatic hammers, miscellaneous: Wm. A. Pate, Washington, $2,800.

Class 60, do., 4 bottom riveters, and 8 jam riveters: Wm. A. Pate, Washington, $1,675.

Class 63, do., 4 reversible pneumatic drilling machines. Independent Pneumatic Tool Co., Chicago, $230.

Class 64, do., 26 pneumatic drilling machines, corner: Independent Pneumatic Tool Co., Chicago, $1,625.

Bids were opened by the bureau of supplies and accounts, navy department, Feb. 27, for furnishing materials and supplies, to be delivered at various naval stations, in accordance with the schedules and classes enumerated, as follows:

Schedule 4264, class 1, San Francisco, one tandem steam roller, 5-ton: Buffalo Steam Roller Co., Buffalo, $2,200 and $1,800; Erie Machine Shops, Washington, $1,770; Iroquois Iron Works, New York, $1,800; Kelley-Springfield Road Roller Co., Springfield, O., $2,075.

Schedule 4265, class 11, Mare Island, one double seaming machine, motor driven: F. A. Brands Co., New York, $1,188.50 and $1,033.20; C. W. Bliss Co., Brooklyn, $1,040.

Schedule 4266, class 21, Mare Island, 2 forced-draft, steel-plate fans, etc., for U. S. S. Jupiter: B. F. Sturtevant, Hyde Park, Mass., $2,209 and $2,089.

Schedule 4267, class 22, do., 10 pumps and spare parts, for U. S. S. Jupiter: Blake & Knowles Steam Pump Works, New York, $15,347.32; M. T. Davids, New York, $10,473.80 pt.; Warren Steam Pump Co., New York, $16,244.05.

Schedule 4329, class 41, Washington, installation of 75-ton crane runway: Niles-Bement-Pond Co., New York, $8,740 and $6,860; Penn Bridge Co., Philadelphia, $8,960.

Schedule 4330, class 42, Washington, for furnishing, erecting, and putting in operation at the naval proving ground, Indian Head, Md., one electric freight elevator of about 3 tons capacity: Albro-Clem Elevator Co., Philadelphia, $2,627; J. B. Abt, Baltimore, $2,720; Faunt Le'Roy Elevator Co., $2,715; Otis Elevator Co., New York, $2,670; Ohio Electric Machine Co., Columbus, O., $2,831; Standard Plunger Elevator Co., New York, $3,500 and $4,400; the Suplee Elevator Co., Inc., Philadelphia, $2,665.

Schedule 4331, class 51, Charleston, one vertical drilling machine, 50 inches, with special attachment for tapping: Manning, Maxwell & Moore, New York, $1,037 and $748; Niles-Bement-Pond Co., New York, $1,785.

Class 52, do., one hydrostatic wheel press, 96-inch, 400-ton motor driven: Bethlehem Steel Co., South Bethlehem, Pa., $2,540; Camden Iron Works, Camden, N. J., $2,653; Drew Machinery Agency, Manchester, N. H., $2,825; the Kemp Machinery Co., Baltimore, $2,510; Manning, Maxwell & Moore, New York, $2,282; Niles-Bement-Pond Co., New York, $2,680.

Class 53, do., one vertical milling machine, motor driven and fitted with rotary attachment: Brown & Sharp Mfg. Co., Providence, $2,220 and $2,208; Kemp Machinery Co., Baltimore, $2,057, $22,142, $2,394, $2,470 and $2,422; Manning, Maxwell & Moore, New York, $1,475 and $1,945; Niles-Bement-Pond Co., New York, $1,495; J. T. Ryerson & Son, New York, $2,194.

Schedule 4333, class 71, Charleston, 12 watt-hour meters: Duncan Electric Mfg. Co., Lafayette, Ind., $129.75 pt. and $77 pt.; General Electric Co., Schenectady, N. Y., $130 pt.; Sangamo Electric Co., Springfield, Ill., $177.11 pt.; Western Electric Co., New York, $416.15; Westinghouse Electric & Engineering Co., Washington, $132.24 pt.

The isthmian canal commission has awarded a contract to the Stacey-Schmidt Mfg. Co., York, Pa., for delivering at the isthmus 22 spillway gate machines, under circular 661, class one.

Probably No Tariff Legislation at This Session

Senate Committee Continues Hearings—Follansbee Proves a Strong Witness—If Report is Made it Will Not Be Favorable to Bill

The senate committee on finance continued last week hearings of manufacturers opposed to the passage of the Underwood bill. Hearings are practically concluded, although there may be some odds and ends to pick up before the committee takes up the consideration of its report. Senator Penrose said to a representative of THE IRON TRADE REVIEW *that he is opposed to any change in the metal schedule of the Payne act until such changes have met the approval of the tariff board. Other members of the committee, probably the majority, share this feeling of the chairman, and it seems likely that the committee will either not make any report or will make an adverse report. What action will be taken by the senate is difficult to predict, but it does not seem at all probable that the Insurgents and the Democrats will be able to agree on a tariff bill relating to the metal schedule. If they do, President Taft will promptly veto the bill in accordance with his well understood policy of not approving any tariff bills which are not based upon investigation by his tariff board.*

W. U. Follansbee, of Pittsburgh, was a very strong witness and none made a greater impression upon the committee. He was capable, incisive and aggressive. His premise was that the Underwood bill had been drawn up in ignorance of the facts, without sufficient consideration and with an indifferent regard for American capital and American labor, but primarily labor, and he proved his contention admirably throughout. He met every issue squarely as it was advanced and he left no question uncovered. Every reply was unanswerable and convincing. He was on his feet for many hours and had a more gruelling task to perform than anyone who has appeared before the committee, but he did his work magnificently. It is impossible to see wherein the tin plate manufacturers could have been better represented. His naturally combative spirit was tempered with fairness and candor and he concluded by advocating a reduction in the duty on tin plate from 1.20c to 1 cent flat. The duty in the Underwood bill works out to about ½ cent, which Mr. Follansbee very clearly showed threw the seaboard, or principal market, of the United States wide open to the foreign tin plate makers.

The committee is fortunate in having so excellent an executive as Senator Penrose as its chairman. He forces the issue along and dispatches a great deal of business in the course of a day, waiting neither for various members nor witnesses, but going along with whatever may be available at the moment.

After President Wallace H. Rowe, of the Pittsburgh Steel Co., had concluded his formal statement to the senate committee on finance last week, he was asked a number of questions by members of the committee. Senator Simmons asked:

"Is there any serious competition in fixing prices?"

"It is very bitter," replied Mr. Rowe, adding that competition in cotton ties had become so keen that his company had withdrawn from the business. In general, price is regulated by the law of supply and demand and he had never known of absolutely uniform prices to obtain.

"Is there not a standard quotation?" asked Senator Simmons.

"No, sir, there is not. I believe that the committee has a very wrong impression of the business."

"How much of an export trade have you?"

"None whatever."

"Can you explain how it is that American manufacturers can sell barbed wire in Germany and yet cannot meet German competition here?" asked Senator Simmons.

"Ninety per cent of the exports of steel products," replied Mr. Rowe, "are made by the United States Steel Corporation which can obtain much lower rates than smaller manufacturers, owing to the great diversity of its products which enables it to charter vessels outright and load them up with a great variety of articles. By that means the Corporation can probably reduce freight rates to one-half what other manufacturers have to pay."

Need of Merchant Marine

"In this connection I might say that I have been greatly surprised at the lack of interest which congress exhibits in our merchant marine. Legislation should be enacted which would enable us to build up our merchant shipping."

James A. Campbell here interposed to say that the barb wire may not have gone to Germany, but to a neutral market.

"That is so," interjected Senator Penrose, chairman. "When Mr. Farrell was here two years ago, he explained to the committee that it did not follow that the products were consumed in the country to which they were consigned, but may have been consigned there for transshipment."

Mr. Rowe closed by again urging legislation on behalf of an American merchant marine as necessary to the full development of the American manufacturing market.

"I strongly recommend some action in that direction," said Senator Heyburn.

James A. Campbell then gave a thorough explanation of the export trade of the United States in iron and steel products. He said:

"All this export trade in steel products is done by the United States Steel Corporation. It has agents in all the neutral markets of the world and it is a large exporter of steel bars, pipe, wire nails and other products, of which it keeps a great stock in many quarters of the globe. It possesses many advantages of manufacture, owning its own railways, vessels and raw materials and a few years ago it formed an export company to develop the foreign field. It manufactures a very large tonnage and must export some of it. In good years the Steel Corporation does not care for the export business. It would doubtless much rather devote its attention wholly to the home market, but it is compelled to take care of its export in good years, otherwise it would have none in lean years. It is, therefore, compelled to maintain a constant organization abroad. Last year the Corporation exported something like 2,000,000 tons. It is when prices are de-

pressed at home that it makes some money abroad. It does not always follow that commodities are sold for less abroad than at home, but I don't think that you ought to complain about it if they are. If 80 per cent of our output can be sold at home, it is good policy to sell 20 per cent abroad, even at cost. It enables the American manufacturer to operate his plant to its full capacity, giving steady employment to labor and reducing overhead expenses. Personally we cannot afford to export; I think few of the independents do; we don't make sufficient variety. You are mistaken, I think, about our products going to cheap markets such as Germany. They are probably sent elsewhere. Concerning Canada, the duty is small, and we are enabled to reach Alberta and western Canada cheaper than England. That's the reason we go to Canada."

"How about eastern Canada?" asked Senator Williams.

"We would never think of quoting rates to eastern Canada," replied Mr. Campbell.

Schmidt Protests for Chain Makers

John C. Schmidt, president of the Standard Chain Co., of Pittsburgh, appeared before the senate finance committee on Friday to enter his protest against the metal schedule of the Underwood bill, especially the change from a specific duty to an ad valorem duty which has in it so many elements of possible fraud. His brief was as follows:

"I represent the Standard Chain Co., of Pittsburgh, which is a manufacturer of all grades and sizes of welded chain. While the variety of chain is nearly infinite, it falls naturally into three classes:

"First, hand-made chain, in which only the highest grade workmen are employed.

"Second, machine-made, or scarf link coil chain.

"Third, polished chain, such as trace chain and the lighter sizes of coil, halter and machine chain.

"These three divisions refer only to welded chain. In addition there is a considerable quantity of chain made on automatic machines, which is known as weldless chain.

"In the industry there are 32 plants manufacturing chain. These plants are located in eight different states, and are distributed as follows: Pennsylvania, 14; Ohio, 7; Missouri, 1; Illinois, 1; New Jersey, 2; New York, 3; Indiana, 2; Connecticut, 1. Total 31.

"The average cost of producing chain of all sizes and grades shows

Material (including fuel) represents	47.46 per cent.
Skilled and unskilled labor represents	36.05 per cent.
All other factory expenses (including administration)	16.49 per cent.
Total	100.00 per cent.

Based on Actual Production

"These percentages are based upon actual production, and, therefore, give a proper average. If the light sizes only were taken into consideration, they would show that at least 85 per cent, or possibly 90 per cent, of the total cost of producing this light chain is in labor. Under the present classification, and for years past, there has been a specific duty on chain, and in place of an ad valorem—although the specific duty, under the present tariff, is supplemented by an ad valorem duty of not less than 45 per cent—I would strongly recommend the retention of the specific duty, as it is a matter of great difficulty often to distinguish by eye-sight the various grades of chain made by various manufacturers.

"The hand-made labor scale has been advanced approximately 33 per cent in the past 10 or 12 years, the advances ranging from 22 per cent to 46 per cent. The last advance was made in March, 1907, since which date no change has been made. The machine-made labor cost has advanced 19 per cent in the past 10 years. The difference in these advances is partially explained by the statement that the process of manufacturing hand-made chain shows no change whatever, whereas in the manufacture of scarf-link or machine-made chain, the appliances for heating and forging have been appreciably improved, so that the output has been increased. You will understand, I would respectfully state that the direct labor in the manufacture of chain is paid at a scale of piece work prices."

"What percentage of your product is exported?" asked Senator Smoot.

"About 5 per cent," said Mr. Schmidt, "principally to Canada and a little to southern countries, but none at all to Europe."

Mr. Schmidt said that about 5,000 men are employed in the industry.

Chain Made by Women

Eli Atwood, of the Lebanon Chain Works, Lebanon, Pa., testified that his principal business is the manufacture of cable chain and that he had supplied considerable product to coast ship yards for use on battleships and cruisers and large merchant vessels. He said that his business would entirely leave if the Underwood bill should become law, as it would immediately open the American market to the English manufacturer. It is practically impossible for the American manufacturer to meet the English scale of wages. He stated that there is a difference of 40 per cent in the wage scale between the United States and England. His family has included chain makers for three generations, his grandfather having established the business in the chain-making center of England. The business was pursued by his father until he finally decided to come to the United States and establish his business here. He added that some time ago when the Standard Oil Co. was building 36 vessels abroad, he tried, merely as an advertisement, to get the chain contract, but he could not come within 25 per cent of the English quotation. Considerable of the work in England is performed by women, who take the rods home and weld them in little forges in the back yards. This is known as the "cottage system."

"There is none of that in this country?" asked Senator Penrose.

"No, sir; but we have to meet the market in chain so manufactured," was the reply.

Mr. Atwood said that there would be no sense in his staying in business if the Underwood bill passed, as he could not possibly compete.

"Couldn't you lower your wages?" asked Senator McCumber.

"Not without a strike," was the answer.

"But, if wages are generally lowered throughout the entire country, couldn't you then in sympathy lower them?"

"We have not raised or lowered wages in ten years," replied Mr. Atwood. "The machine-made chain men have altered their schedule of wages, but our chain is wholly produced by hand labor and our men are well content with their earnings."

Mr. Atwood then submitted data on the original quotation to him from Brown, Lennox & Co., Pontypridd, Wales, on the 900 fathoms of 3¼-inch stud link chain for the battle ships that were built for the Argentine republic by the New York Ship Building Co., Camden, N. J., and the Fore River Ship Building Co., Quincy, Mass.

The delivered price, c. i. f. Phila-

delphia, of the English maker was 26s and 3d for 112 pounds, equivalent to $5.62 per 100 pounds, whereas, the actual cost of the chain delivered manufactured by the Lebanon Chain Works was $6.36 per 100 pounds, allowing no profit whatever to the manufacturer. The chain for these two battleships was imported and the duties, amounting to $24,132, were subsequently remitted.

"What proportion of chain is made in hand forges?" asked Senator Heyburn.

Mr. Atwood did not believe there was any so made, but Senator Heyburn insisted that he had seen blacksmiths make it for the convenience of their immediate neighborhood.

John C. Schmidt here interposed to say that he did not think that such chain made throughout the entire country would equal 5 per cent of the total production.

"Five per cent is what I thought it might amount to," said Senator Heyburn. "Now what is your estimate of the total production of chain in this country?"

"About $5,000,000 worth."

"Well, don't you think that $250,000 worth should also be protected?"

"I certainly do," said Mr. Schmidt.

Thomas F. Woodhouse, of the Woodhouse Chain Works, Trenton, N. J., next appeared, submitting schedules to show the great difference which exists in the labor cost here and abroad which makes it impossible for the American manufacturer to compete with his English rival, especially so as so much female labor in the homes enters into English chain manufacture. Obviously in this character of work the manufacturer has no overhead charges, as the worker furnishes his own shop, fuel and tools. As the labor is performed by either women or boys, very little is paid for it. These are conditions with which the American scheme of life cannot compete, and, therefore, a reasonable tariff is necessary to preserve the home market.

Effects On Business Disastrous

Interesting from many points of view was the detailed testimony of W. P. Worth, of Worth Bros. Co., Coatesville, Pa. He declared that his company's business would be greatly affected by the proposed bill, saying that it would simply be put out of business on the coast and would only be able to preserve a part of its western trade.

"What do you call the west?" asked Senator Heyburn, who comes from Idaho.

"West of the Alleghenies," replied Mr. Worth.

The witness stated in reply to a question that his company used New Jersey ore, Spanish ore, Lake Superior ore and Nova Scotia ore.

"Have you any Cuban ore?"

"No, sir."

"Do you buy any ore from the Steel Corporation?" asked Senator Heyburn.

"No, sir, the Corporation does not sell any ore."

Mr. Worth said that his business was established by his family in 1851 and represented an original investment of $250,000. Its stock is entirely held by the family and the plant probably today has a value of between $6,500,000 and $7,000,000, its earnings having been steadily put back into it. The business did not pay any dividends for a long time, but is now declaring about 30 per cent upon the original capital of $250,000, which has not been increased.

"Who was responsible for the reduction of the duty on iron ore from 40 cents in the Dingley bill to 15 cents in the Payne bill?" asked Senator Heyburn.

"I don't know, but I presume the independents who were probably anxious to get cheaper ore."

Senator Heyburn then began to ask questions about the Tennessee purchase, but he did most of the talking, as Mr. Worth was doubtless not informed on this transaction; but the point that Senator Heyburn was evidently trying to establish was that the Tennessee company was a menace to the Steel Corporation in the export trade and that the Corporation acquired it to complete a monopoly of that field.

"The Corporation controls the export trade, does it not?" asked the senator.

"I don't know," replied Mr. Worth "but I should think that the Jones & Laughlin company could export if it desired. It is a very large concern."

"The Jones & Laughlin company has already informed us that it does not export," said Senator Penrose.

Senator Heyburn made some further references to the duty on ore and Mr. Worth said that he did not agree with C. D. Dyer that the tariff on ore should be 50 cents. He thought that that was altogether too high.

"This talk of Schwab's of a big steel plant on the Chesapeake using Cuban ores is an idle dream, isn't it?" asked Senator Heyburn.

"No, I think not. They may eventually be able to eliminate the chrome and nickel from the Cuban ores and thus enable Schwab to carry out his plans. They are geniuses, you know."

Mr. Worth testified that he was unable to meet Belgian competition on the Pacific seaboard in plates. He said that about 25 per cent of the imports of Worth Bros. Co.'s ore came from Nova Scotia, from which source a good hematite is obtained. The Tennessee ores are too silicious for his company's use.

"Do you know what the attitude of the Steel Corporation is toward this bill?" asked Senator Clark.

"They are naturally opposed to a reduction of the tariff. When Mr. Farrell was here two years ago, he was very helpful in supplying information to this committee. In all my experience I cannot find a time when you reduced the tariff that we have had good business."

"And yet you come in here and advocate a reduction in the duty on iron ore," said Senator Simmons.

"I am not advocating a reduction on iron ore," said Mr. Worth indignantly. "I am not here to advocate any reduction on anything. I am perfectly willing that the 15 cents shall stand on ore. What I did say was that I do not agree with Mr. Dyer that it should be 50 cents. I think that is altogether too high."

"You are perfectly satisfied, then, with present conditions?" Senator Clark.

"Yes, sir. We really haven't had a chance to give the present tariff bill a fair trial as yet. We haven't had time to try it out and it ought to be given that time."

Mr. Worth ended with a plea to let present conditions alone and let the steel industry try to find itself. At present it is not making much headway.

Horace A. Beale, of the Parkesburg Iron Co., Parkesburg, Pa., appeared to protest against the reduction of the duty on charcoal iron boiler tubes. He said that his company employs about 500 men at present and does a little export business to Canada.

"What are your earnings?" was asked.

"We lost money last year."

"Is that a normal condition?" was asked.

"I hope not."

Mr. Beale explained that the Steel Corporation formerly purchased the total output of his skelp mill, but having lately gone out of the business of making charcoal tubes, left his company to market the output of this mill elsewhere,

which necessitated a serious readjustment of his business.

Duty on Ferro Alloys

E. F. Price, of the Electro-Metallurgical Co., Niagara Falls, protested against further reduction of the tariff on ferro alloys. He showed the low cost of production abroad, especially in Norway, where hydro-electric power costs $3.67 to $5.67 yearly horsepower. Some wages are paid on the basis of 70 odd cents daily. It requires one horsepower one year to make one ton of ferro-silicon. The market is dominated by the foreign product. Ferro alloys are not raw material, but a diversified product through scientific chemical operations by skilled workers. Our cost power and labor make necessary a tariff protection of 30 per cent ad valorem; the present duty does not protect; further reduction will ruin the industry.

Robert S. Woodward, vice president and general manager of the Standard Roller Bearing Co., of Philadelphia, submitted very interesting testimony on tariff schedules pertaining to roller bearings. The manufacture of roller bearings has extended rapidly since the automobile industry was established and will, if wisely protected, grow to far greater dimensions. At present one-third of the roller bearings used in this country are imported. Mr. Woodward said that his company is endeavoring to cultivate a market for American rolling bearings in England, and is now exporting to that country about 1 per cent of its output for advertising purposes and for the purpose of keeping in touch with the English consumer. He said, however, that it is necessary to sell in the English market for 31 cents as against 50 cents for a similar product in this country. The only successful way of meeting English competition will be to establish a factory in England, which his company contemplates doing. He spoke in behalf, not only of his own company, but of the Hyatt Roller Bearing Co., Newark, N. J., the New Departure Co., Bristol, Conn., and the Timkin Roller Bearing Co., Canton, O. His

Tin Plate Makers and Employes Protest

The proposed schedule on tin plate in the Underwood bill was the subject of some of the most interesting testimony brought out before the Penrose senate finance committee during its entire sitting. The protest against the enactment of the Underwood proposal was registered by both makers of tin plate and employes of the concerns engaged in this great industry.

John Williams, Pittsburgh, president of the Amalgamated Association of Iron, Steel and Tin Workers, was present accompanied by other representatives of organized labor. President Williams gave a history of the tin plate industry, showing the failure of American manufacture until protected under the McKinley tariff law. Now more than enough is manufactured and many factories are idle. He showed that reduced prices to consumers have followed increased duty. The contemplated schedule on tin plate would reduce wages and any wage cut means inevitable labor troubles. Wages here are about 100 per cent higher than in Wales.

Walter Larkin, Martins Ferry, vice president of the tin plate division of the Amalgamated Association, said that since the passage of the Underwood bill by the house his membership is raising strong protest. Tariff reduction would make importation cheaper than production here. The Wilson tariff reform law reduced wages and labor was idle five months. In Wales five men are used in the tinning process, which takes eight men here, but the latter turn out one-third more product.

Representing the fifteen independent makers of tin plate, William U. Follansbee, of Pittsburgh, secretary and treasurer of the Follansbee Bros. Co., had submitted a brief on the tin plate schedule, which has been noted previously. He was on his feet for three hours of Feb. 23, interpreting the brief which had been submitted to the ways and means committee of the house, and analyzing Congressman Palmer's address on the subject. So aggressive was the witness and so thorough was his examination by members of the committee that he was quite exhausted when he concluded.

Mr. Follansbee began his testimony by attacking the Underwood bill as a most incompetent piece of legislation, hasty in its construction and wrong in its conclusions, exhibiting a lack of knowledge and manifesting the utmost indifference to its consequences upon labor. His attitude was so earnest that Senator Kern stopped him.

Were Not in Touch

"Why do you say that these men, who have worked a long time on this bill, were lacking in knowledge?" asked Kern.

"If you will bear with me a while I shall show you that they were not in touch with the situation."

"But didn't they get their information from you?"

"They asked me for some and I forced more upon them; but they have drawn incorrect conclusions from the information furnished," replied the witness.

Mr. Follansbee said that the Steel Corporation controlled 60 per cent of the tin plate output today, but that when the Corporation was formed ten years ago it controlled it all. Therefore since the formation of the Corporation, new tin plate mills have come into existence which now manufacture 40 per cent of the country's total output. Mr. Follansbee also protested against an ad valorem duty, saying that it was a most unscientific method, susceptible of much fraud, and that it had been discarded by most countries.

"I have received a letter," said Senator Lodge, "from a Liverpool correspondent in which he makes the point that in the higher grades of tin plate, that is tin plate selling over 26s 9d the ad valorem rate would advance the duty."

"I am afraid that you have not understood your correspondent, senator," replied Mr. Follansbee. "There is no such tin plate."

"Well," replied Senator Lodge, "I may not be very intelligent, but I do think I understood him. I will send for his letter."

Labor's Wage Large Item

Mr. Follansbee proceeded to say that the large item of expense in the production of tin plate is the labor cost. Millions have been expended to discover some mechanical process of performing the work now done by labor but no machine has as yet been invented. He then related how he had visited Wales in 1888, as an importer of tin plate. This was before the passage of the McKinley act, and before any attempt had been made to manufacture tin plate in this country. The Welsh people seemed to think that the reason that tin plate could not be made in this country was on account of the hot climate, but Follansbee laughed at them on that score. He told how the Welsh girls worked in the mills. A sixteen-year old girl would pick up a box, weighing 100 pounds, rest it on one hip and carry it to the point of assembly. Follansbee said that he would not like to see American girls doing that kind of work and he protested against it to the manager.

"Why don't you put in a track and have a little donkey do this work with a truck?" he asked. "It would be far better and cheaper."

"Why, the donkey would eat more than we pay these girls," replied the manager.

Mr. Follansbee said that it made his heart sick to see girls doing foul and nauseating work about the pickling machines.

By this time Senator Lodge had found the letter from the Liverpool correspondent, and, sure enough, it was as he had stated.

"Is not my understanding correct?" asked the senator.

"Yes sir, you understand the letter correctly," replied Mr. Follansbee. "It is your correspondent who is wrong. Now, we import some tin plate and we have a Liverpool correspondent. Ninety-five per cent of Welsh plate is standard and it comes in boxes of 100 pounds, 90 pounds and 80 pounds, at 13s for 100 pounds, 12s 6d for 90 pounds and 12s for 80 pounds. There is no plate selling for

27s 6d. Your correspondent is simply speaking of a 200-pound box. Now, as I say, we do import a little tin plate. There are persons who imagine that an imported article is superior to the domestic, and sometimes an architect will specify imported tin plate and, of course, it has to be furnished."

Proposed Tariff Too Low

Resuming his address, Mr. Follansbee said that the making of a tariff law would be a simple matter if all the manufacturers were as frank and candid as the tin plate makers. He suggested a 20 per cent reduction in the tariff on tin plate from the Payne act. The duty on tin plate under the Payne act is 1.20 cents per pound; he suggested that it be made 1 cent flat. The ad valorem duty as proposed in the Underwood bill works out at ½ cent a pound, which Mr. Follansbee protested was too low and would have the effect of opening the seaboard market to England.

Senator Cullom asked as to a comparison in prices of tin plate now and at the time it was being exclusively imported.

"It has been very greatly reduced in price," was the reply.

Mr. Follansbee protested again and again that in the Underwood bill the tin plate industry has been made "the goat." He added that the tin plate manufacturers are standing absolutely on their brief and cannot possibly stand a duty less than 1 cent a pound.

Senator Heyburn, who is a staunch Republican, protested against any reduction in duty. He took this position avowedly on behalf of new interests who might want to go into the manufacture of tin plate, maintaining that any reduction in duty would work to their disadvantage while probably not to the material disadvantage of established plants. He spoke for those, he said, whose prosperity depended upon the general prosperity of the whole country. Moreover he argued that the duty on lead might be affected by any reduction in the duty on tin plate.

Mr. Follansbee replied that he believed in the principle of protection, but he believed the day had passed when anyone could enter into the manufacture of tin plate.

"I am a protectionist," said Senator Heyburn, "and I don't like to have anyone come in here who also is a protectionist, and yet advocates any reduction in protective duties."

Resuming Mr. Follansbee said that the McKinley act carried a protective clause on block tin in order to encourage prospectors to locate block tin mines in this country, but that after years of search no deposits had been discovered in the United States. All block tin is therefore imported of necessity. He added that the wage of common labor in Wales is only one-third of what it is in this country and that the question of the tariff is only a question of labor costs after all.

Mixing up Crafts

Referring to Congressman Palmer's remarks on the lower wages of common labor at the Bethlehem, Pa., works (that 48 per cent get less than 16 cents an hour, 39 per cent less than 14 cents and 66 per cent less than 18 cents), Mr. Follansbee pointed out that Mr. Schwab does not make tin plate at Bethlehem and that irrespective of the accuracy or inaccuracy of the quoted figures, they had nothing whatever to do with tin plate. Mr. Follansbee said that the average wage paid in his plant is $3.25 per day or $874 per annum.

"Mr. Schwab testified," said Senator Smoot, "that the average paid in Bethlehem is over $700 per annum."

Mr. Follansbee stated that expert rollers in the tin plate mills received $8.90 per day. He added that he had great respect for the man who went through college and became a professional man, but that he had equal respect for the boy who went through high school and then into the mills to fit himself to be a tin roller. He insisted that it requires quite as high an order of intelligence to be an expert roller as to be a lawyer. In fact an expert roller has to use his brain all the time.

A great many workmen obtain $5 per day and from that to $3 and $2.50. Laborers are paid from $1.60 to $1.80 according to whether the work is inside or outside work. He added that the average workday is less than nine hours and that he personally is opposed to a 12-hour day.

Mr. Follansbee remarked that the tin plate industry might eventually be able to dispense with the tariff altogether.

Senator Heyburn protested against any such talk, declaring that it was making protection an expediency rather than a principle.

"Nevertheless that is my personal conviction," said Mr. Follansbee.

Selling Price Lowered

In reply to a question by Senator Lodge, the witness said that the American production of tin plate had tremendously lowered its selling price throughout the entire world, adding: "The American tin plate worker is making higher wages now than ever before—that is to say, that while the manufacturers may have paid more per ton of output when the workmen were learning the business in this country, the workmen are now earning more money than they ever did."

Mr. Follansbee declared that the Wilson tariff bill had put American tin plate manufacturers out of business.

"And yet it carried the same duty that you are now advocating," said Senator Heyburn.

"I have always maintained," said Mr. Follansbee, "that the Wilson schedule in its relation to tin plate was eight years ahead of its time."

Mr. Follansbee then proceeded to make a very convincing argument as to why the tariff should not be lowered to the Underwood scale. Two-thirds of the consumption of tin plate is located on the seaboard. That is natural owing to the great canning business conducted on the coast in oysters, fish and fruit. The city of Baltimore is the largest single consumer of tin plate in the world, doing a tremendous business in canning oysters. Therefore, with two-thirds of the consumption right at the port of entry, the Underwood bill would throw the field wide open to England. He showed conclusively that the tin plate industry had always followed the tariff, and that it has in fact been made the foot ball of the tariff. The experiences of the past have proved how sensible is the influence of the tariff upon the industry. American manufacturers would have difficulty in holding the trade on the coast under the ad valorem rate of the Underwood bill.

"And moreover under it," interposed Senator Smoot, "England could use us as a dumping ground."

Mr. Follansbee then exposed the fallacies in Congressman Palmer's speech and showed how he had been led to draw incorrect conclusions from the evidence submitted to him. He dwelt at length also upon the enormous growth of the canning industry, which has quadrupled in the past twenty years. He proved that the per capita wealth of the United States has increased 50 per cent in the past twenty years, and that tin plate is a large contributory element in this prosperity.

"If we have been prosperous since the McKinley act was passed," said he, "tin plate has been our mascot; do not make it 'the goat'."

In answer to questions he said that the general state of the steel business is at present deplorable, but that the tin plate mills are running full. In explanation of this seeming inconsistency he explained that the price of sheet bars, the raw material, is down $6 per ton, which is a considerable item. On the other hand steel is ruling high in Wales owing to a boom period which the British market seems now to be enjoying. This is a condition which makes the present tariff more or less of an untried measure.

Workmen Enter Protests

David Selway, of Steubenville, O., a skilled employe of the Pope Tin Plate Co., testified that he had been sent to Washington by his fellow workmen to protest against a further reduction of the duty on tin plate, and gave as the reason the fact that a lower tariff would cause a decline in wages, which labor in the tin plate industry would be unable to stand.

Jack A. Jones, of Pittsburgh, a roller in the Follansbee mills, stated that he had been elected by the employes of the works to go to Washington and present their protest against a change in the tariff, as the threatened change was a menace to their wages.

INCREASED CAPACITY

Planned Eventually For Edgar Thomson, But No Action at Present.

Reports recently circulated by the public press that extensive improvements are to be made to the Edgar Thomson works of the Carnegie Steel Co., at Braddock, Pa., refer to general plans that have been in contemplation for several years past, but are still in such indefinite form, according to official advices, that there is little prospect of their materializing in the near future. No recent action has been taken in the way of allowing appropriations or approving plans by the Steel Corporation officials that suggest early action with this project. The additions to rail capacity of the country in recent years, especially in the Chicago district, have diverted much tonnage of this nature from the Pittsburgh district and from the Edgar Thomson plant, which was primarily built and designed for a rail mill. The result is that it has not been possible to operate this plant to capacity, except at intervals. It has, accordingly, been appreciated by the Steel Corporation executives that greater diversification of the products of this plant is necessary, which would insure its more complete and permanent serviceability. The improvements along this line to be made eventually will include an open-hearth steel works and finishing capacity of a nature that is yet to be determined. At present, the Edgar Thomson works is exclusively a Bessemer steel plant.

SCALE IS ANNOUNCED

By Ohio Liability Board for Workmen's Insurance Scheme.

The state liability board of awards of Ohio has announced the rates which employers, who agree to contribute to the insurance fund by which victims of industrial accidents and their dependents will be compensated, beginning March 1, must pay. Rates for each class of industry are based upon the degree of hazard to the employes, and the premium to be paid by each employer is estimated by applying the rate as fixed per $100 to the entire amount of the payroll. The highest rate will be charged employers of men blasting in stone quarries, where the board considers the risk is very great. The minimum charge for this class of insurance is $17.50 and the maximum $72.80. The lowest charge for protection is made to textile manufacturers. The rate on ore reduction is $2.65 to $36.90 and on ore and coal handling it is $2.20 to $29.80.

The metal schedule, which includes machine shops and foundries, quotes rates ranging from 95 cents to $21.20. The board will contract with no plant for a longer period than six months If at the expiration of the contract the accidents in a plant have been noticeably fewer or more than estimated by the firm, the rates will be proportionately raised or lowered in the next contract.

After the law becomes effective, employers who do not join will be deprived of their three common law defenses in damage suits instigated by injured or relatives of employes killed at work.

Pittsburgh Steel Co. to Vote $3,500,000 Increase

A special meeting of the Pittsburgh Steel Co., Pittsburgh, has been called for May 1, to vote on an increase in capital stock from $14,000,000 to $17,500,000. The additional stock is to be used for the erection of blast furnaces and to make other improvements. The proposed stock will be similar to the former issue, being 7 per cent cumulative preferred shares. Arrangements have already been made, it is said, for underwriting the new issue.

Subway Extensions. — Bids have been asked to close March 22 by the public service commission of New York for the construction of section 2A of the Broadway-Lexington avenue subway extensions. This section will be 530 feet in length and under the contract, the construction of 157 feet additional of the Canal street subway is called for. The Broadway section will be of four tracks and the Canal street line of two-track width. The original estimates placed the steel requirements of this section of the Lexington avenue line at about 4,250 tons of fabricated material, including the steel bars.

Production of Pig Iron in Canada Last Year

The American Iron and Steel Association has received direct from the manufacturers the statistics of the production of pig iron in Canada in the calendar year 1911, in gross tons.

Total Production.—The total production of all kinds of pig iron in Canada in 1911 amounted to 824,345 tons, against 740,210 tons in 1910, an increase of 84,135 tons, or over 11.3 per cent. The production in 1911 was much the largest in the history of the Dominion. Of the total production in 1911 799,716 tons were made with coke and 24,629 tons with charcoal, coke and electricity, etc.

Production Since 1894.—The production of pig iron in Canada in the last eighteen years is given below, in gross tons. Spiegeleisen and ferromanganese are included. For all these years the statistics given have been compiled by the American Iron and Steel Association.

Years.	Tons.	Years.	Tons.
1894.....	44,791	1903.....	265,418
1895.....	37,829	1904.....	270,942
1896.....	60,030	1905.....	468,003
1897.....	53,796	1906.....	541,957
1898.....	68,755	1907.....	581,146
1899.....	94,077	1908.....	563,672
1900.....	86,090	1909.....	677,290
1901.....	244,976	1910.....	740,210
1902.....	319,557	1911.....	824,345

Merger Completed of Several Canadian Foundries

Toronto, March 4. — The Canadian Foundries & Forgings, Ltd., has been organized, with an authorized capital of $3,000,000 by the merger of the James Smart Mfg. Co., Ltd., of Brockville, the Canadian Billings & Spencer, Ltd., Welland, and the Canada Forge, Ltd., Welland. The capitalization is as follows: Common stock $1,250,000, of which $960,000 is issued; 7 per cent preference stock, $1,250,000, of which $960,000 is issued; and bonds, $500,000, of which $67,000 is issued. The James Smart Co. has been in operation since 1857, its product comprising the heavier forms of hardware, furnaces, stoves and machinery. The Canadian Billings & Spencer is an offshoot of the Billings & Spencer, of Hartford, Conn., with an output of automobile parts and fine forgings, and the Canada Forge turns out heavy drop forgings.

UNDERWOOD TYPEWRITER

Report for 1911 Shows Most Successful Year in History.

The report of the Underwood Typewriter Co. for 1911, shows net earnings of $1,375,599, a surplus of $496,240, a profit and loss surplus of $1,099,157, and total assets of $15,476,785. It was the most successful year in the history of the company. The company expects the benefit of increased production early in the spring, because it has just finished two new factory buildings. At the company's annual meeting Sylvester C. Dunham, president of the Travelers' Insurance Co. of Hartford, was elected a director to succeed A. R. Erskine, resigned. The regular quarterly dividends were declared.

Proposed Bonuses to be Paid in New Zealand

The government of New Zealand has prepared a bill for the encouragement of the manufacture of iron and steel from native ores and iron sands. For the payment of bonuses on production, $332,072 is set aside in the bill to be disposed of as follows: For the first 30,000 tons of pig iron or ingot steel, $4.86 per ton; for the first 20,000 tons of bar, rod, angle or other iron or steel, $4.86 per ton; for the first 10,000 tons of plate iron or steel, $4.86 per ton; for the first 5,000 tons of fencing wire, $6.08 per ton. The bill further provides that after the expiration of 40 years the plants and other property of the manufacturers receiving such bonuses shall pass without compensation into the hands of the government. The government may also, at any time after 15 years, take over such property after making proper compensation.

Held Annual Meeting

President Leonard Peckitt, of the Empire Steel & Iron Co., at the annual meeting of the stockholders recently held in Jersey City, said that the iron trade was in a very dull condition last year and added immediate future. The retiring directors, who were re-elected, met Wednesday in New York to organize.

The Advance Stove Works, Evansville, Ind., has increased its capital stock from $30,000 to $70,000.

The American Brass Co. has advanced the base price of copper wire, f. o. b. mill, in carload lots, from 15¼c to 15½c per pound, net.

New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing concerns have filed articles of incorporation:

Corinth Machinery Co., Corinth, Miss.; $25,000; by H. E. Ray, L. F. Garrett and others.

Texas Foundry & Machine Co., Dallas; $10,000; by E. B. Holland, J. H. Durkee and R. W. Marple.

The Diamond Block Machine Co., Bristol, Va.; $5,000; to manufacture machinery; by L. T. Lowe and G. M. Warren.

The Moore Locomotive Ashpan Co., Montgomery, Ala.; $32,000; by W. S. Monk, J. I. McKinney, I. C. Campbell and others.

Mulberry Foundry & Mfg. Co., Mulberry, Fla.; $100,000; by C. C. Martin, A. B. Hull Jr., W. F. Walker and James M. Langford.

General Supply Co., Charlotte, N. C.; $25,000; to manufacture fire protection equipment; by R. A. Mayor, B. J. Smith and M. G. Hunter.

Given Moore Co., Columbus, Ind.; $25,000; to manufacture farm implements; by directors, Given Moore, Alfred Moore and A. C. Moore.

The Matchless Heater Co., Holyoke, Mass.; $10,000; to manufacture hot water heaters; by G. C. Gill, G. P. Hosmer, Holyoke, and P. S. Sinclair.

The Hartford Special Machinery Co., Hartford, Conn.; $50,000; to manufacture machinery; by E. W. Smith, E. T. Canfield and H. R. Shailer, Hartford.

Buffalo, Ontario, Smelting & Refining Co., Ltd., Toronto; capital, $40,000; provisional directors, Arthur L. McGovern, James M. Donahue and E. W. Wright.

The Murray Wire Co., Newark, N. J.; $125,000; to manufacture wire, iron and steel; by P. J. Murray, A. Murray, Newark, and J. F. Macomber, New York City.

Interstate Railway Frog & Switch Co., Salisbury, N. C.; $30,000; by P. H. Thompson, F. M. Thompson, W. B. McCanless, D. L. Arey, E. C. Gregory and others.

The Barnes & Kobert Mfg. Co., New Haven, Conn.; $20,000; to manufacture metal goods; by B. Barnes, New Haven; F. P. Kobert, New York City; J. E. Wheeler, New Haven.

The Canadian Kent Mill Co., Ltd., Hamilton, Ont.; capital, $10,000; to manufacture machinery; provisional directors, Oren M. Beach Jr., Herbert S. Lees and Robt. P. McBride.

The United States Agricultural Co., Hartford, Conn.; $100,000; to manufacture engines; by L. C. Grant, S. A. Grant, Enfield, Mass.; F. H. Whipple and C. H. Cooley, Hartford, Conn.

John H. Hall & Sons, Ltd., Brantford; capital, $100,000; patternmaker and machine manufacturer; provisional directors, John H. Hall, Ernest L. Hall, Emerson D. Hall and others.

Gem Flint Iron Co., Ltd., Sarnia, Ont.; capital, $100,000; to operate mines and treat ores and minerals; provisional directors, Alexander Maitland, James Rood Jr., George B. Sedgwick and others.

Ferrum Mfg. Co., Pittsburgh; $10,000; to manufacture machinery from brass, wood, iron and steel; by W. P. Weiman, William Martin, Robert A. Gillispie, of Pittsburgh; David Brown and W. G. Anderson, Emsworth, Pa.

Peerless Roller Bearing & Appliance Co., 33 North Second street, Camden, N. J.; $300,000; to manufacture roller bearings, automobiles, motor trucks, etc.; by Pannock E. Sharpless, Ward, Pa.; Wm. H. Kneedler, Landsdale, Pa.; Isaac Michener, Jenkintown, Pa.; Wm. J. Moore, 1307 North Fifteenth street, Philadelphia; J. Roberts Jarrett, 210 Westmont avenue, Raddonfield, N. J.

General Industrial

N. M. & A. R. Johnson, Ishpeming, Mich., have arranged to manufacture and market the mine signaling and recording machine, which was described in THE IRON TRADE REVIEW, Sept. 14, 1911.

The Hartman-Greiling Foundry & Machine Co., capital $75,000, has perfected its organization and is now operating its new plant on Fox river at Green Bay, Wis. The officers are: President, Herman Greiling; vice president and treasurer, C. Hartman; secretary, L. H. Barkhausen. The company will do a general machine and repair business, specializing in marine work.

The American Compensating Valve Co., of Manitowoc, Wis., which recently was incorporated for $25,000, will manufacture a valve device for internal combustion engines to increase efficiency, reduce fuel consumption and generally strengthen carburetion. The company does not intend to engage in the manufacture of the patent at once, being now in negotiation with local manufacturers for the production.

The Hess Flume Co., a new concern, has acquired property at 2166 and 2176 Fifteenth street, Denver, where machinery will be installed for the manufacture of iron flumes for irrigation purposes. The company has been in business about six months and has turned out a big product, nearly all of which has been used in government work. The cost of machinery to be installed will total $10,000.

J. A. Fitzpatrick, Inc., 1123 Broadway, New York, is the corporate name under which the steel construction business is to be continued and which was formerly conducted by Fitzpatrick & Coombs, Inc. R. D. and A. W. Coombs have withdrawn from the company. The new officers are J. A. Fitzpatrick, president; Thomas G. Griffin, vice president and manager of construction; David Mattoon, treasurer, and H. R. Spence, chief engineer.

The Union Boiler Works Co., Toledo, capitalized at $100,000, advises that it has purchased all of the equipment for its plant and is not in the market for any machinery at present. However, the company will receive prices on a general line of material used in the manufacture of boilers, such as boiler plate, tank steel, bolts, nuts, rivets, flanged heads, hand-hole plates and saddles, etc. The company's principal line will be the manufacture of special machines for steam plants.

The Julian Motor Co., Syracuse, N. Y., whose recent incorporation was noted, advises that it proposes to build gasoline motors for all uses. They will be known as "America's Highest Priced Motor", this being obtained, the company says, from the quality of the product to be manufactured. The company is not prepared to say what the extent of its

output will be, it depending entirely upon the demand. At present it does not contemplate erecting a factory as the company is located with the Brown-Lipe Co.

The Forsyth Metal Goods Co., Buffalo, recently incorporated, advises that it will manufacture the line formerly manufactured by the Forsyth Mfg. Co. The output is problematical as to extent, but the line will be increased and contract work solicited. New buildings are not contemplated at this time and equipment will only be added as required. The line handled by the company includes molding hooks, household and hardware specialties, bath room accessories, metal stamping, bicycle parts and specialties, dies and tools, etc.

At the first annual meeting of the recently organized Mauston Aluminum Co., of Mauston, Wis., the following-named officers were elected: President, M. L. Bunnell; vice president, W. B. Curran; secretary, Walter Marvin; treasurer, B. F. Broezel. E. W. Frenz was appointed general superintendent of operations. Orders have been placed for all machinery and equipment required for the present, but schedules are being prepared for some heavy equipment to be installed as soon as the entire buildings of the former Mauston Boat Co. are remodeled to suit the purpose.

The plant of the Marshalltown Drop Forge Co., Marshalltown, Ia., has been leased by the Iowa Dairy Separator Co., of Waterloo, Ia., which has already taken charge of and is operating the Marshalltown factory. The lease is for six months with the privilege of an extension of time. Before the fire which destroyed the plant of the Waterloo Drop Forge Co., the latter had the contract for making drop forgings for the Iowa Dairy Separator Co., which has leased the Marshalltown factory to secure forgings necessary to the carrying on of its business.

At the annual meeting of the stockholders of the J. A. Fay & Egan Co., Cincinnati, manufacturers of wood working machinery, which was held at the offices of the company on Feb. 20, the following officers and directors were elected: President, Thomas P. Egan; first vice president, S. P. Egan; second vice president, F. T. Egan; secretary, W. M. Green; treasurer, A. A. Faber and general manager, C. P. Egan. Directors were elected as follows: Thomas P. Egan, Joseph Rawson, S. P. Egan, William Boswell, F. T. Egan, L. G. Robinson, C. P. Egan, A. A. Faber and J. E. Bruce.

The Fort Pitt Bridge Works Co., Pittsburgh, has purchased a large Thomas automatic spacing table with multiple punch from the Standard Bridge Tool Co., Pittsburgh. The table will automatically handle four 8 x 8-inch angles, 90 feet long, at one pass, or two narrow plates up to 35 inches wide, or one wide plate. The trailer is designed with low rails, permitting the operators to have easy access for spacing the material on the rollers. The punch will be equipped with all the appliances for gaging angles in punching, levers for operating the gages, etc. The gages are of special design to permit quick adjustment.

The Tulsa Stove & Foundry Co. has decided to locate its plant at Sand Springs, Okla. A site of four acres adjacent to the steel rolling mill has been selected and work will begin at once in order that the company may have its stoves on the market by the first of May. The first building will be 40 x 250 feet and 40 x 130 feet of this space will be used for the molding room. The rest of the building will be used for nickel and mounting room. The company will make a complete line of wood and coal stoves and light castings. It will also have the first and largest nickel plate plant west of St. Louis, it is said.

The Riverside Steel Casting Co. is now operating its new plant at Plank road and the Passaic river, Newark, N. J. This consists of a foundry building, 40 x 150 feet, with lean-tos, each 25 x 150 feet, extending along the sides. The plant also includes a power house, 25 x 50 feet, a pattern storage, 25 x 50, and a concrete office building, 15 x 30 feet. The property embraces 1½ acres and is provided with private siding on the Pennsylvania railroad as well as water shipping facilities. The company operates four crucible furnaces, each having a daily capacity of 40 pots, one large annealing furnace, three large drying ovens, one 5-ton crane, exhaust tumbling barrels, etc. The waste heat from the furnaces is used to produce steam.

In addition to continuing the gray iron foundry and machine business, acquired through the taking over of the plant formerly occupied by Coombe & Massey as a general foundry and machine shop, the Lambertville Iron & Steel Co., Lambertville, N. J., recently incorporated, will install furnaces in the near future for the manufacture of small steel castings. The officers of the company are: President, George W. Massey; secretary, A. Raymond Gould; treasurer, John E. Massey. Mr. Gould was formerly connected with the Gould Coupler Co., of Depew, N. Y., and later with the Trenton Malleable Iron Co., as general manager. Mr. Massey was a member of the old firm of Coombe & Massey. No new equipment is needed just at this time.

The Van Dorn & Dutton Co., Cleveland, advises that the demand for its hard service drills and reamers has notably increased during the past few weeks. An order has just been received from the McClintic-Marshall Construction Co., Pittsburgh, for 24 hard service electric reamers. This is the third recent order from this concern, the two previous ones having called for 12 reamers each. These reamers were all for use on exacting work on the Panama canal. Other large orders received call for 25 hard service universal electric drills for the Hupp Motor Car Co., Detroit; 24 hard service universal electric drills for the C. R. Wilson Body Co., Detroit; 20 hard service electric reamers for installation in the new steel freight car shops of the Haskell & Barker Car Co., Michigan City, Ind., and 20 machines of various sizes for the British isles.

Trade Notes

The American Rolling Mill Co., Middletown, O., has established an office in St. Louis, in the New Bank of Commerce building.

Hubbard & Co., Pittsburgh, announce a change in the management of their Chicago office. O. W. Youngquist, who for a number of years has been connected with H. Channon & Co., as railroad sales manager, has been appointed manager of Hubbard & Co.'s Chicago office, with headquarters in the Fisher building.

Fires

The plant of the Detroit Seamless Steel Tube Co., 841 Jefferson avenue, west, Detroit, was recently damaged by fire to the extent of $8,000.

A three-story machine shop of the Germantown Tool Works, Germantown, Pa., was damaged by fire Feb. 28, entailing a loss of about $50,000.

The Wyandotte Foundry Co., Wyandotte, Mich., lost its plant by fire, Feb. 1, the damage being estimated at $15,000. Rebuilding along fireproof lines is planned.

The plant of the Missouri Malleable Iron Co., East St. Louis, was damaged to an estimated amount of $50,000 by fire, Feb. 28. The flames were confined to the acid room, machine shop, blacksmith shop and grinding room. The loss is fully covered by insurance. F. E. Nulsen is president of the company.